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OF

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EDITED BY

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ON THE VOLE AND SHREW OF THE ORKNEY ISLANDS.

By WM. EAGLE CLARKE.

With Report by Prof. O. CHARNOCK BRADLEY, M.B., C.M.

IT is a somewhat remarkable fact that since 1848, when Messrs. Baikie and Heddle published their excellent—for the date—"Historia Naturalis Orcadensis," until the past year, 1904, no naturalist seems to have paid any attention to either the Vole or the Shrew inhabiting the Orkney Islands. The consequence is that the misleading—pardonably misleading, it should be said—statements of these authors regarding the specific identity of these Orcadian mammals have been unfortunately accepted by and repeated in all the subsequent writings on the subject with which I am acquainted.

As regards the Vole, in the "Zoologist" for July 1904 (pp. 241-246), Mr. J. G. Millais astonished British naturalists by describing the Orcadian Vole as a species new to science under the name of *Microtus orcadensis*, and as peculiar to the Archipelago.[1] To that date the Vole inhabiting the

[1] Mr. Millais has informed me, since the above was written, that he has obtained this Vole in certain parts of Shetland.

islands had been regarded as the Short-tailed Vole (*Microtus agrestis*), a species which is common and widely distributed over the mainland of Great Britain.

It would not have been so surprising had this Vole proved to be a racial form of some European species, but that it should be entirely distinct from any of its congeners is certainly a most remarkable fact. Indeed it is not too much to aver that this little mammal is, from a scientific standpoint, among the most interesting and important of existing British Vertebrates.

Microtus orcadensis, though undoubtedly quite a distinct species, shares certain peculiarities with both the Water Vole and the Field Vole. Thus, in stoutness of build, in the comparative prominence of the ears, in the density and colour of the fur (especially the tint of its under surface), and, broadly, in its cranial characters, it resembles the Water Vole. While in the shortness of its tail, and to some extent in its dental characters, it approaches the Field Vole. In size it is somewhat intermediate between these species, large specimens being nearly half as large again (40 per cent) as the latter, though it is decidedly smaller than the Water Vole.

In colour it is sandy-brown above (the apical portion of the hairs being yellowish-brown, the basal slaty-gray) with long protruding black hairs interspersed; below it is sandy rufous. Half-grown examples are duller in colour, being darker than the adults on both the upper and under surface, and in this respect they resemble the Water Vole of similar age.

Mr. Millais' largest male measured 6.75 ins. (head and body 5.5, tail 1.25 ins.). The following are the comparative measurements and weights of the largest specimens of *Microtus orcadensis* and *M. agrestis* in the collections of the Royal Scottish Museum :—

	M. orcadensis.		*M. agrestis.*	
	Male.	Female.	Male.	Female.
	ins.	ins.	ins.	ins.
Head	1.30	1.27	1.18	1.10
Body	3.55	3.11	3.08	3.13
Tail	1.34	1.30	1.40	1.32
Hind Foot . . .	0.72	0.70	0.75	0.70
Fore Foot . . .	0.43	0.40	0.40	0.40
Ears	0.51	0.50	0.50	...
Weight (in grammes) .	53.50	42.63	31.80	32.95

Being anxious to make the acquaintance of this interesting little mammal, and in order to obtain specimens for the Museum, I decided, on leaving the Flannan Islands, to visit Orkney for these purposes. I arrived at Stromness on the evening of the 22nd of September last, and remained until the morning of the 26th. I soon discovered the haunts of the Vole, which are much in evidence in suitable localities, by reason of its deep, channel-like runs. My experience regarding both the animal and its habits was necessarily limited, but I found that it was extremely abundant. It went into my traps as freely at mid-day as it did during the night or early morning; indeed I frequently saw it traversing its runs during the daytime, so that it is evidently to a considerable extent diurnal in its habits.

Its haunts were chiefly on ground clothed with short heather and coarse grass. Here its runs were conspicuous and extensive, being well worn and stretching for long distances; and being in some cases exposed, in others forming tunnels under the denser growth of vegetation. The animal seems to have a predilection for the vicinity of damp localities, and, frequently, its runs led to such; indeed in some instances the runs and tunnels were formed in saturated *sphagnum* by the sides of pools of water.

The food in the stomachs of those examined consisted of a green mass of finely triturated vegetable matter.

I append a report on the cranial and dental characters, most obligingly furnished by my friend Professor O. Charnock Bradley, who most kindly undertook the investigations at

my request. I am also deeply indebted to him for the drawings of the teeth.

An examination of the skull of *Microtus orcadensis* (Millais), and a comparison of it with the skulls of other British species of *Microtus* and of *Evotomys glareolus*, the Bank Vole, disclose many features from which it may be contended that the Orkney Vole merits a place as a distinct species among the British mammalia. Measurements of the skull of this animal have been made according to a method of craniometry suggested some short time ago.[1] These measurements, and the indices computed from them, as well as similar measurements and indices of other species of *Microtus* and *Evotomys*, are given in the following table :—

	M. orcadensis.	*M. amphibius.*	*M. agrestis.*	*E. glareolus.*
CRANIUM.				
Length	19	26	19	17
Breadth	14	19	12	11
Cephalic index	**73·68**	**73·07**	**63·15**	**64·70**
Height. (1) Oblique	11.5	16	11.5	9.5
,, (2) Vertical	7	10.5	6	6
Oblique altitudinal index	**60·52**	**61·53**	**60·52**	**55·88**
Vertical ,, ,,	**36·84**	**40·38**	**31·57**	**35·29**
Bistephanic diameter	2	6.5	4.5	6
Frontal length	9.5	15	9	8
Stephanic index	**21·05**	**42·33**	**50·00**	**75·00**
Fronto-parietal length	14	20	13.5	12
FACE.				
Length	11	15	9	8
Breadth	6	7·5	5	5
Facial Index	**54·54**	**50·00**	**55·55**	**62·50**
PALATE.				
Length	14.5	22	12	11
Breadth	3	4	3	3
Palatine index	**20·68**	**18·18**	**25·00**	**27·27**
Cranio-facial length	27	38.5	25	22
Upper cranio-facial index	**127·27**	**133·33**	**150·00**	**150·00**
Lower ,, ,,	**40·74**	**38·96**	**36·00**	**36·36**

From the above indices it is seen that the skull of *Microtus orcadensis* agrees in no one point with the skulls of all the other species. In some instances the difference is not great, and it may possibly be argued that similar differ-

[1] 'A Method of Craniometry for Mammals,' "Proc. Roy. Phys. Soc. of Edinburgh," vol. xv. 1902.

ences might be met with in the examination of several skulls from the same species. Undoubtedly variations do occur among animals of the same species, but they are not so marked as those shown above. And, further, if there is variation in one or several points, there is agreement in most features.

An analysis of the indices may be briefly summarised as follows :—

The breadth of the cranium (compared with the length) of *M. orcadensis* is approximately equal to that of *M. amphibius*, but markedly greater than that of *M. agrestis* and *E. glareolus*.

The oblique height of the cranium is about the same in *M. orcadensis*, *amphibius*, and *agrestis*. In *E. glareolus* it is decidedly less.

When the vertical height of the cranium of *M. orcadensis* is compared with that of the others, it is found to be not very different from that of *E. glareolus*, but less than in *M. amphibius*, and greater than in *M. agrestis*.

A very striking feature in the skull of *M. orcadensis* is the degree of development of the temporal fossa, and, particularly, the close approach it makes to the middle line in its more anterior part. This is shown by the stephanic index, which is much smaller in this animal than in any of the others.

Another very obvious feature in the cranium is the much greater sagittal diameter of the interparietal bone. This is very clearly demonstrated if the bone be measured in two directions—transverse and sagittal—and an index computed ; the transverse diameter being taken as 100.

	M. orcadensis.	*M. amphibius.*	*M. agrestis.*	*E. glareolus.*
INTERPARIETAL BONE.				
Transverse diameter . .	6	9·5	7·5	7
Sagittal diameter . .	3·5	3	3	3
Index	**58·33**	**31·57**	**40·00**	**42·85**

It is clear that the sagittal diameter of the interparietal bone of *M. orcadensis* is more than half the transverse ; whereas in the others it is less than half.

The face of *M. orcadensis* resembles that of *M. agrestis* in regard to its width. It is narrower than in *E. glareolus*, and broader than in *M. amphibius*.

If the length of the cranium is compared with the length of the face, it is found to be slightly less in *M. orcadensis* than in *M. amphibius*, and decidedly less than in *M. agrestis* and *E. glareolus*.

When the length of the face is compared with the length of the entire skull, *M. orcadensis* has a slight advantage over *M. amphibius*, and a decided advantage over *M. agrestis* and *E. glareolus*. Taking the two foregoing statements together, it is evident that the face is longer in *M. orcadensis* than in any of the others.

The relative width of the palate is slightly greater in *M. orcadensis* than in *M. amphibius*, but distinctly less than in *M. agrestis* and *E. glareolus*.

The molar teeth of *M. orcadensis* possess certain features to which attention must be directed. The number of enamel-spaces in the first upper molar is 5 ; and in the second, 4. In the third molar there are clearly 5 spaces, but the most posterior is partly divided into two. When this tooth is compared with the corresponding tooth of *M. agrestis* there is found to be a striking similarity. In *M. agrestis* there are 6 spaces. Therefore it may be claimed that in *M. orcadensis* there are also really 6 spaces, but the posterior two are not completely separated from each other. It is conceivable that, if other specimens were examined, separation might be discovered even greater than that shown in Fig. 1, A 3.

The spaces in the lower molar teeth are shown in outline in Fig. 2, A. The first molar has 9 spaces ; the three most anterior being incompletely separated, as is the case in *M. agrestis* (cf. Fig. 2, B). The second and third molar have 5 and 3 spaces respectively.

Summarising, it may be said that the molars of *M. orcadensis* resemble those of *M. agrestis* except that there are 4 spaces in the second upper molar instead of 5.

In considering all the features of the skull together, it is clear that, except in regard to the teeth, *M. orcadensis* is more closely allied to *M. amphibius* than to any other

British species. At the same time it departs sufficiently widely from *M. amphibius* to justify the conclusion that it forms a distinct species.

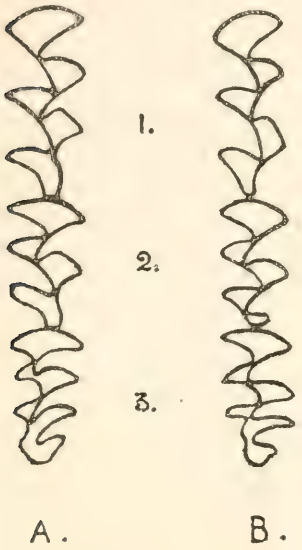


FIG. 1.

A = Upper molars (right) of *M. orcadensis*.

B = Upper molars (right) of *M. agrestis*.

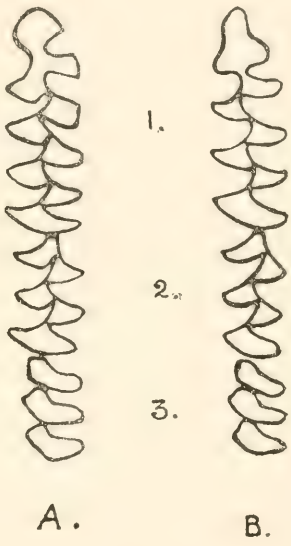


FIG. 2.

A = Lower molars (left) of *M. orcadensis*.

B = Lower molars (left) of *M. agrestis*.

As regards the Orkney Shrew. It has down to this date been considered an interesting fact, in the insular distribution of British mammals, that while the Lesser Shrew (*Sorex minutus*) is the species found in the Hebrides and in Ireland, it was not only absent from the Orkneys, but was replaced there by the Common Shrew (*Sorex araneus*). I make bold, however, to say that I very much doubt if the Common Shrew has *ever* been captured in the Orkneys. At the date of publication of Baikie and Heddle's "Historia" the Lesser Shrew had not been recognised as an inhabitant of our islands, so that it is not surprising that these authors should have regarded the Orcadian Shrew as being the same species as that which was common to Great Britain.

Under these circumstances I was much interested, and to some extent surprised, to capture the Lesser Shrew in some numbers during the three days I was at Stromness. Since then I have received many others, but not a single example of the Common Shrew. All the examples were taken in the runs of the Voles, and were secured either in the daytime or during the night or early morning. These Orkney Lesser Shrews seemed to me to be more brilliantly coloured on the under surface than any other examples I have seen, being pure silky white, not greyish white, below.

Royal Scottish Museum,
Edinburgh, *November* 1904.

THE BIRDS OF THE FLANNAN ISLANDS; OUTER HEBRIDES.

By Wm. Eagle Clarke.

The Flannan Islands, known also by the name of the Seven Hunters, form a group of small uninhabited isles lying out in the Atlantic. They are situated from twenty to twenty-three miles west of Gallan Head, at the mouth of Loch Roag, Island of Lewis; and forty miles N.E. of St. Kilda, with the exception of which they are among the most western islands of Great Britain.

They may be said to form two groups: an eastern one comprising four islands (Eilean Mhor, Eilean Tigh, Soraidh, and an island which is nameless on the chart); and a western one lying two miles farther out and composed of three islands (Rhoderheim, Bronna Cleit, and Eilean Gobba). In addition there are several smaller islets, making in all some twenty islands, skerries, and rocks. They are probably the wildest spots in the British Isles.

The seven main islands are precipitous and rise on all sides direct from the ocean, and this fact, taken along with their exposed situation, renders them extremely difficult to land upon.

The data upon which this contribution is based, consist



EILEAN MHOR, FROM THE EAST.



EILEAN MHOR, FROM THE SOUTH.

almost entirely of observations made on Eilean Mhor, the largest and most northerly of the eastern group, whereon stands the lighthouse, completed in 1899. From this station Mr. Harvie-Brown and I have received schedules recording the occurrences of birds down to the present date. From these returns it was evident that an important, though perhaps subsidiary, stream of migratory birds swept over the islands in both spring and autumn. In order to supplement our knowledge relating to these interesting movements I, along with my friend Mr. T. G. Laidlaw, spent sixteen days on the island—September 6 to 21—during the past autumn, residing in the lighthouse by the special permission of the Commissioners for Northern Lighthouses.

In addition to the information thus acquired, a pioneer paper on the subject was written by Mr. Harvie-Brown and published in the "Proceedings of the Glasgow Natural History Society" (1882, pp. 197-209). This consists of an account of a visit paid to the islands on June 9, 1881, during which the group was circumnavigated, and a short time spent on Eilean Tigh, on which a landing was with some difficulty effected. During this trip Mr. Harvie-Brown observed thirteen species, all, with the exception of several Fulmars observed in the neighbourhood of the islands, the usual summer rock-breeding birds to be observed in such haunts.

Eilean Mhor is precipitous on all sides. The cliffs on the north and east are the highest, and attain an elevation of 282 feet; those on the south being the lowest, and mostly under 200 feet. Thus the top of the island forms an elevated plateau, sloping towards the south, and having an area, by survey, of sixteen acres,[1] clothed with grass and sea pink, and with here and there bare patches of peaty turf and exposed rock. Where not forming precipices, the steep rocky banks facing the sea have a profuse growth of herbage, chief among which is a Marguerite. These dangerous slopes were much resorted to as feeding grounds by the smaller migratory birds, for, amid the shelter they afforded, they were comparatively safe from the assiduous attentions of the ever-

[1] Mr. Harvie-Brown (*op. cit.*) gives the area of grass as "some 80 acres," but on what authority is not stated.

present Peregrine Falcon and from the casual visits of the Merlin. There is no cover elsewhere, unless some short narrow runnels connecting a series of diminutive pools on the exposed plateau can be regarded as such.

The rocks forming the island consist of several varieties of Lewisian gneiss, traversed by numerous veins of granite, pegmatite, and hornblende. They show evidence of considerable disturbance, being crumpled, and twisted, and tossed up and down, in a most remarkable manner.

There are three ancient buildings on the island. The chief of these resembles a large dog-kennel, and is supposed to have been built for ecclesiastical purposes, and is called the "Blessing House" on the Ordinance Map. The other two are Brochs, each with two square chambers, and surmounted with a bee-hive-shaped roof.

The islands are resorted to annually, as breeding stations, by hosts of marine birds, chief among which, in point of numbers, is the Puffin; and the most interesting, from an ornithological point of view, the Fork-tailed Petrel and the Fulmar.

Ornithologically, however, the islands are chiefly remarkable on account of the streams of birds of passage which sweep over them in both spring and autumn, when *en route* between their northern summer and their southern winter homes. These streams are surprising for their magnitude, both in individuals and species, when the far western situation of the islands is taken into consideration. The result of our investigations on these interesting western movements was most satisfactory and much valuable information was obtained, but further researches elsewhere will have to be undertaken ere the results are ripe for publication. The lantern throws out three slowly revolving beams, each of 140,000 candle power; but during our stay few birds visited the light, the weather conditions being almost uniformly unfavourable for "a night at the lantern." We were somewhat surprised to find that, so far as we could ascertain, no birds seemed to visit the island from Lewis and Harris during our stay. Thus we never saw a single Starling—a species which is abundant in the Outer Hebrides, and much given to wandering in the autumn; and only a single



EAST LANDING, EILEAN MHOR.



SOUTH LANDING, EILEAN MHOR.

Skylark was observed. Birds were always numerous, but they were northern immigrants on passage to southern winter quarters, many of which remained on the island for some time.

As regards other classes of animals, the fauna is naturally a limited one. There are no shell-bearing land Mollusca, owing, perhaps, to the absence of lime in the crystalline rocks forming the islands; but there are two slugs, namely, *Arion ater* and *Limax agrestis*, both of which are not uncommon.

Foremost among the Insects, by reason of its numbers, is the Earwig, which swarms everywhere. Beetles of a few species were more or less abundant, and a collection made by me has been kindly examined by Prof. Hudson Beare, whose remarks upon them will be found on pp. 20-22. Flies, too, were abundant, and a considerable collection was made, and upon this Mr. Grimshaw will eventually report. My co-editor, Prof. Trail, will have something to tell about the Flora of the island in a future number of the "Annals."

A pleasant duty remains ere this portion of my notes closes. I have to thank Mr. Dick Peddie for, among other kindnesses, the loan of the negatives from which the pictures have been reproduced. We have to express our grateful acknowledgments to the lightkeepers for the valuable returns they have systematically made during the past four years. To three of them, namely, Mr. Wm. Begg, the principal keeper, and to Messrs. Ross and Anderson, assistant-keepers, additional thanks are due from Mr. Laidlaw and myself for the many attentions shown to us, as well as for valued assistance rendered during our recent visit. Not only did they help make our visit an extremely pleasant one, but they added materially to any success that may have been achieved.

Mr. Begg is much interested in the bird-life of the islands, and, I am indebted to him for much information on the subject.

Raven (*Corvus corax*).—A pair is resident among the islands, remaining all the year round, and nesting on one of the outer group. During our visit this pair was seen daily, but they had evidently dismissed their young before we arrived. One day

a strange pair appeared, to the evident concern of the raven proprietors, who were very unsettled and noisy during the visit.

Hooded Crow (*Corvus cornix*).—A pair seen occasionally at all seasons, but said not to breed; at any rate their young have not been observed. These birds were seen throughout our visit and one of them was shot, but the survivor had a fresh mate two days later.

Rook (*Corvus frugilegus*).—An occasional visitor, either singly or in small numbers, twelve seen on April 10, 1902, being the highest record. The other records are for January, once; March, once; April, twice; May, once.

Jackdaw (*Corvus monedula*).—Only once observed, namely on February 22, 1901.

Starling (*Sturnus vulgaris*).—Appears on passage, sometimes in great flocks, which remain for several days. Not a single Starling was seen during our sojourn, and these visitors are evidently migrants to and from the Continent. The earliest record for its appearance relates to a single bird seen on September 27, 1904. They appear chiefly in October and November, along with other northern birds of passage; and again from mid-February, during March, and sometimes as late as mid-April. On April 15, 1904, many Starlings, with Redwings, Wheatears, and Skylarks were at the lantern at 10.30 P.M. It has only twice been noted as visiting the island during winter, namely in 1903, when two appeared on the 5th and one on the 18th of December.

Chaffinch (*Fringilla cælebs*).—Common in the autumn of 1901, being seen on several occasions during the winter of that year, but has rarely appeared since. In the year named, great numbers arrived on the 30th of October, several large flocks during November, and flocks again on the 3rd and 23rd of December. Since that year the bird has only been twice noted, namely, on the 17th of January, 1902, several; and on the 18th of November, 1903, one.

Brambling (*Fringilla montifringilla*).—Observed on one occasion only, namely, on the 15th of November 1901, when nine or ten appeared.

Greenfinch (*Ligurinus chloris*).—Has been known to visit the island on two occasions only, namely, a large flock on the 30th October 1901, and another on the 17th December of the same year. A wing of one of these visitors was sent for identification.

YELLOW BUNTING (*Emberiza citrinella*).—Is only once recorded. On the 17th September 1900 one was observed resting on the island.

LINNET (*Linota cannabina*).—Is said to be an occasional visitor. The only records noted are one on 2nd and four on the 9th July 1901, and one on 9th October 1902.

TWITE (*Linota flavirostris*).—A summer visitor only, arriving in the spring and departing early in the autumn—it had left before our arrival on the 6th of September. Two pairs nest annually on Eilean Mhor.

SNOW BUNTING (*Plectrophenax nivalis*).—A winter visitor in large numbers. The earliest record of its appearance came under our notice, two being seen on the 14th of September 1904. A few usually arrive later in the month, but the great flights do not appear until October, when they are sometimes noted as in "thousands." A considerable number remain the winter. Late in March great flocks gather on the island previous to departure, and many are then in summer plumage. It is also observed in numbers on passage, with other emigrants bound north in April, and has been observed as late as the 20th of May.

LAPLAND BUNTING (*Calcarius lapponicus*).—As already recorded ("Annals," 1904, p. 207), we found this species present on our arrival on the island on the 6th September, and the keepers told us that the birds were seen by them on the 3rd, and were thought to be Snow Buntings. It was one of the first birds seen by us, and was still present on the island at the date of our departure. From careful computations we set down their number at from thirty to forty individuals, but there may have been more, for we were not able to visit the other islands, some of which were well suited for their requirements. They sought food on the bare patches of peat, and down the face of the cliffs; and at night found roosts among the coarse grass growing on the top of the island and on the steep banks. When on the wing they were inclined to be noisy, some of their notes resembling those of a Linnet, others those of the Snow Bunting, especially its call note *tūke, tūke.* They were usually seen in small parties, perhaps families, and the examples obtained were adults of both sexes and young birds of the year.

There must have been a considerable and remarkably early immigration of this bird during the past autumn; and though it seems to have escaped notice elsewhere in Scotland, except the lonely isle of Suleskerry, where I saw several examples on the 22nd of September, yet it has been recorded for the south, east, and centre of England,

Skylark (*Alauda arvensis*).—Is chiefly a bird of passage, but a few visit the island during the winter, driven by cold from elsewhere.

Strange to say we only saw a single example, namely, an immature bird on the 12th of September. The northern migrants do not arrive until October, the 2nd of that month being the earliest recorded date of their appearance, and the passage southwards lasts until the end of November. The return movement northwards in spring commences about the middle of February, and is continued during March. It is only occasionally recorded for April, the latest date being the 15th, in 1904, when it occurred at the lantern with Starlings, Redwings, and Wheatears.

Short-toed Lark (*Calendrella brachydactyla*).—This unlooked-for visitor from the far south is believed to have appeared on the evening of the 19th of September. It was detected as a stranger early the following day, its light colour and small size attracting attention. Its note on rising on the wing, when disturbed, resembled that of a Skylark. As before stated ("Annals," 1904, p. 206) it proved to be a female, and is the first recorded occurrence of this species for Scotland.

Pied Wagtail (*Motacilla lugubris*).—Mr. Begg assures me that he has seen this species, but that it is an uncommon visitor.

White Wagtail (*Motacilla alba*).—This species is probably common on migration in both spring and autumn. It was certainly one of the most abundant species observed by us from the day of our arrival, 6th September, to our departure on the 22nd. During this period two distinct arrivals took place, namely, on the night of the 8th, along with Meadow Pipits and Wheatears, and again on the 11th, when it appeared along with the same species at 2.30 A.M., at which hour several appeared at the lantern. The numbers dwindled after the 13th, but a few were present down to the 23rd, as is testified to by specimens received after our departure.

Wagtail (*Motacilla sp.*),—The only bird that ran the gauntlet of identification during our visit, was a short-tailed Yellow Wagtail. This bird appeared on the morning of the 20th of September, and for two days baffled all our attempts to solve its identity. It was shy, wary, and restless in the extreme, and never allowed us to approach sufficiently near to get a satisfactory sight of it.

Meadow Pipit (*Anthus pratensis*).—This is another species which occurs commonly on double passage. It was abundant during the whole period covered by our visit; and there were con-

siderable arrivals on 8th September, with White Wagtails and Wheatears; on the 10th, from 8.30 to 10 P.M.; and again on the 11th, with Wheatears and White Wagtails.

The earliest arrival chronicled for the autumn is the 27th of August 1900, when it appeared in considerable numbers, and the latest for the 8th October 1903, when it was abundant with other migrants.

The records for spring are few, but on the 20th May 1904 it is said to have been numerous at midnight along with Wheatears.

Rock Pipit (*Anthus obscurus*).—Resident and extremely abundant. It was marvellously tame, being almost indifferent to one's presence, and came freely into the house. Some examples were much larger than others, and it is probable that all were not natives of the island.

[The Goldcrest (*Regulus cristatus*) has never been observed at the Flannans. It is a well-known bird to all the light-keepers, and its absence from the long list of migratory passeres is worthy of remark.]

Lesser Whitethroat (*Sylvia curruca*).—One was sent to me in the flesh, which had been captured on the 23rd of September 1904, two days after our departure.

Garden Warbler (*Sylvia hortensis*).—One was observed searching for flies on the face of the rocks on the north cliff on the 16th of September, and remained until the 18th, perhaps longer.

Other Warblers have occurred and have been entered in the schedules as "Whitethroat," "Blackcap," and "Willow Warbler," perhaps correctly, but it is very desirable that they should be identified beyond a doubt, before been accepted as visitors to the islands.

Song Thrush (*Turdus musicus*).—A visitor on migration in the spring and autumn, and occasionally in winter.

The earliest date on which the Thrush has been chronicled for the autumn is on the 4th of October 1904, when a single example appeared. It is not until towards the end of the month named that it comes in numbers, along with Redwings, Blackbirds, Larks, etc.; and the passage lasts until mid-November, the 19th being the latest record. Some of these migrants remain on the island for a few days ere they pass on their way southwards. A few appeared on the island on 13th December 1903, and there are two similar records for the first week in February in 1903 and 1904, in one instance along with Blackbirds and Redwings.

The return movement northwards takes place in March,

the 8th being the earliest and the 25th the latest date in which the passages have been recorded, but it probably occurs later.

Redwing (*Turdus iliacus*).—The Redwing appears to be much the commonest member of its genus visiting the island. That this should be so is not surprising, for the species is a summer visitor to Iceland, and thus it is not unnatural that its passage lines should more frequently lie to west than those of the other species of *Turdus*, whose northern summer homes are in Scandinavia, etc.

A few appear in the earliest days of October, along with Pipits and Wheatears, and later with Thrushes, Fieldfares, Larks, Snow Buntings, etc. Sometimes the immigrants, remain several days resting and feeding on the island. The latest date for the autumn passage is the 18th November.

During severe winters numbers have been known to seek the island as a retreat, and in December 1902 they were observed too weak to fly.

On the spring passage, it is again the most numerous Thrush visiting the Flannans. The 7th April is the earliest date for its appearance, and the passage lasts until the end of the month, the 29th being the latest record. During this period it appears in company with Wheatears and Snow Buntings, or with Larks, Wheatears, and Starlings; sometimes in great rushes.

Fieldfare (*Turdus pilaris*).—The Fieldfare is another bird of double passage, occurring regularly in the autumn between the dates 3rd October and 19th November, and sometimes remains a week on the island before moving on. In the spring, when it is apparently much less frequently observed than the other members of the genus, it appears late in April.

As a winter visitor it has occurred on a few occasions, but does not make a long stay.

Blackbird (*Turdus merula*).—Is numerous on double passage: in the autumn, according to the records, from the 11th October to the 20th November; and in spring from the 1st March to the 12th April.

It has on several occasions appeared in winter, but does not appear to remain long on the island.

Redbreast (*Erithacus rubecula*).—Single birds have been seen occasionally, namely on the 15th November 1900; 13th May 1902; 30th March, 19th and 31st October, and 30th November 1903.

? Black Redstart (*Ruticilla titys*).—A bird with a red tail, entered in the schedules as a "Redstart," was observed on the island on the 10th and 28th of November 1903, and was doubtless this species.

Wheatear (*Saxicola œnanthe*).—Was very abundant during the whole of our visit. There were considerable arrivals on the night of the 7th of September, along with Pipits and White Wagtails; and again along with the same species at 2.30 A.M. on the 11th, when it was observed at the lantern, and was in swarms all over the island during the day. There was another arrival on the 17th, when it appeared at the lantern from 11 P.M. onwards. All the birds observed were, with one exception, in the russet plumage of autumn and winter: the exception was a male, which still displayed traces of summer plumage. About four pairs of Wheatears nest annually on the island, but numbers seek it while on migration. The earliest arrivals in the spring are noted for the 7th of April, and the passage lasts until the 20th of May, on which date, in 1904, great numbers appeared at midnight.

The earliest date in the autumn for the appearance of immigrants is the 11th of August, and the latest on the 8th of October.

Wren (*Troglodytes parvulus*).—Wrens are seen occasionally during the autumn and winter months. We hoped to have procured specimens of this bird, but if it was present during our visits it eluded all our attempts to detect it, which was possible, owing to the extent and nature of the steep faces with which the island is surrounded. However, we do not think it probable that the bird was there in September 1904.

It has been observed in January (once), February (twice), March (once), October (four times), and November (four times), On all these occasions, except 12th November 1904, when three were seen, single specimens only came under observation.

Pied Flycatcher (*Muscicapa atricapilla*).—Was first observed on the 13th of September, when three were seen busily engaged capturing insects on the face of rocks in a rift in the cliffs on the north side of the island—as wild a spot as it is possible to imagine. Here these birds were seen daily until the 20th, and perhaps remained beyond that date. All were in the gray dress of autumn. This species is, I believe, an addition to the avifauna of the Outer Hebrides.

Swallow (*Hirundo rustica*).—A casual visitor on passage, whose few visits in spring are chronicled for May and June. In the autumn it has twice been noted for September. The greatest number seen was on the 26th May 1903, when twelve appeared.

Martin (*Chelidon urbica*).—One killed by a Merlin, on the 10th April 1900, was sent to me for identification.

Swift (*Cypselus apus*).—The Swift is regarded as a rare visitor. Previous to our visit there were three records of its occurrence —two for June and one for July. On the 16th September I saw one at 10 A.M., during heavy rain and a strong S.E. breeze. And on the following day, another was flying under the north cliff for several hours, seeking shelter from the strong southerly breeze.

Snowy Owl (*Nyctea scandiaca*).—This bird has only once been observed, namely on the 12th of October 1903, when Mr. Begg saw one on the island at 6 P.M.

Kestrel (*Falco tinnunculus*).—The only occurrences of this species known, are a male shot on the 18th of June, and a female on the 27th of September, 1904.

Peregrine (*Falco peregrinus*).—A pair of Peregrines nest annually on one of the outer islands of the group. During the early days of our visit we saw the old birds accompained by one of their offspring, a male, which they tried their best to drive away from the islands, but all their bullying failed. The old birds left about the 14th of September, but the young male remained, and was a scourge to all the small migratory birds resorting to Eilean Mhor; for it used to dash many times a day over the exposed plateau in search of prey, making havoc among the ranks of the travellers.

Merlin (*Falco æsalon*).—Visits the islands on both the spring and autumn migrations, being observed in March, April, and May; and again in September and October.

A pair appeared on the morning of the 11th of September. They only remained for the day, during which the small migrants had a bad time of it. We had a captive Fork-tailed Petrel, which had been taken at the lantern the previous night. This we released in order to observe its manner of flight, no Merlin being in sight at the time; but no sooner was the Petrel well on the wing than one of the Merlins appeared in hot pursuit, but the Petrel, we believe, reached the sea in safety.

Cormorant (*Phalacrocorax carbo*).—Mr. Begg, who has several years' experience, has never seen this bird at the Flannans. He has heard, however, that eggs have been taken on one of the outer islands. Mr. Harvie-Brown saw several pairs on Bronna Cleit on the 11th of June 1881. We never saw the bird.

Shag (*Phalacrocorax graculus*).—Very common all the year round, and breeding in considerable numbers.

We saw old birds feeding young as big as themselves. The importunities of these great babies were of a very persistent nature, and not at all appreciated by the parent birds, which did their best to shake off their lazy offspring.

Gannet (*Sula bassana*).—Although observed all the year round, Mr. Begg informs me that only a few are seen during the winter months. Soon after the middle of March flocks are observed constantly passing towards St. Kilda, only forty miles distant, and distinctly to be seen each clear day.

During our visit it was always common, but only adult birds were seen.

Heron (*Ardea cinerea*).—An occasional visitor, and only chronicled for the months of August and September.

We saw five of these birds—one on 10th of September, two on the 11th, and one on 17th and 18th. All of these were young. They did not stay long, which is not surprising, for the islands afford no suitable feeding grounds.

Grey Geese (*Anser sp.*).—"Grey Geese" are occasional visitors during the autumn and winter; but the identity of the species visiting the islands has not been ascertained.

Bernacle Goose (*Bernicla leucopsis*).—About two hundred Bernacles winter on the islands, arriving early in October and remaining until late April, and sometimes seen until about mid-May. Many also visit the islands as birds of passage.

Brent Goose (*Bernicla brenta*).—On the 16th of September we saw a bird of this species flying to the S.E. It was well seen, and is the only record for the islands.

Wild Duck (*Anas boscas*).—The only record is for a pair, male and female, shot by Mr. Begg on the 9th of November 1904.

Teal (*Querquedula crecca*).—Has been shot on the island, singly or in pairs, on several occasions in the months of January, April, July, October, and November.

Eider Duck (*Somateria mollissima*).—Nests commonly on some of the islands, but is not seen during winter. It returns early, three being seen on the 13th of February 1904. Old and young were very numerous throughout our visit. They usually formed a straggling flock, and fed under the lee of the islands. Several females accompanied by half-grown young ones kept apart from the main body.

(*To be continued.*)

NOTES ON SOME COLEOPTERA FROM THE FLANNAN ISLANDS.

By Prof. T. Hudson Beare, B.A., B.Sc.

During a stay of sixteen days on the Flannans in the autumn of 1904, from September 6 to 21, for the purpose of studying bird migration, Mr. W. Eagle Clarke collected Coleoptera whenever possible, and he has kindly allowed me the opportunity of going through his small and interesting collection in order that I might name his captures.

The Flannans are a group of small uninhabited islands lying out in the Atlantic, being situated from twenty to twenty-three miles west of the island of Lewis, and forty miles north-east of St. Kilda.

As Mr. Eagle Clarke has already described in this number of the "Annals" (pp. 8-10), the geographical position of the islands, and the main physical features of Eilean Mhor, on which the collection was made, it is unnecessary to say more on the subject here.

The following is a list of the species in the collection, with some notes as to their general distribution in Great Britain :—

Carabus catenulatus, Scop.—(5 specimens); this species is common all over Scotland, and is especially abundant in hilly districts under stones; it is also common in England.

Pterostichus niger, Schal.—(7 specimens); this species is common all over the kingdom, under stones.

Nebria brevicollis, F.—(20 specimens); perhaps the most abundant and widely-distributed species of the Carabidæ which occurs in Great Britain, and found in all sorts of localities.

Calathus cisteloides, Pz.—(6 specimens); this species also occurs all over the kingdom, under stones.

I used, during the time spent in camp on the island of Inchkeith, when I was serving as a captain in the Forth Division Submarine Miners, to find these four species very commonly on that island.

Notiophilus biguttatus, F.—(1 specimen); this is again a common species, the most abundant of its genus, and the most generally distributed in Great Britain.

Calathus melanocephalus, L.—(6 specimens); this species again is exceedingly common all over the kingdom; it occurs under stones, and in all sorts of localities. On high mountains it is replaced by its var. *nubigena*, Hal., which has a dark, almost black, thorax instead of the reddish thorax of the type. All Mr. Eagle Clarke's specimens, however, have a distinctly red thorax, though not quite such a bright red as is common in specimens taken in the south.

Trechus obtusus, Er.—(2 specimens); this species, which is sometimes considered to be only a variety of *minutus*, F., is much commoner in Scotland than in the southern part of the island, and appears to be very widely distributed and very common in the northern part of the country.

The above species all belong to the group commonly known as ground beetles, occurring principally under stones and rubbish, and in moss.

Ocypus ater, Gr.—(1 specimen); this big Staphylinid is perhaps the most interesting of Mr. Eagle Clarke's captures. In Canon Fowler's work on "British Coleoptera," vol. ii. p. 257, it is stated to be rare in Scotland—Forth district only; but since that volume was published Mr. J. J. Walker has taken it at Campbeltown, and he states that it was common in that locality under stones, on turf walls, etc., (see "Ent. Mo. Mag.," 1896, p. 110). Mr. Walker also collected Coleoptera at Stornoway during a visit there in 1895, but though the locality was a very likely one for this species, which is found almost exclusively on or near the coast in muddy places, Mr. Walker did not record it among his captures taken at that locality. It occurs in the Northumberland district, and therefore probably will be found on the east coast as well as on the west coast of Scotland.

Philonthus varius, Gyll.—(1 specimen); this is a universally distributed species, one of the most abundant of the genus in Great Britain.

Aphodius rufipes, L.—(1 specimen); this dung beetle was caught on the lantern of the lighthouse by Mr. Eagle Clarke, at 2.30 A.M. on September 11, and it is, therefore, pretty certain that it must have flown over from the island of Lewis, or from the mainland; it is one of the commonest species of its genus.

Choleva grandicollis, Er.—(3 specimens); there is a possible doubt as to the identification of these specimens, as they are some-

what damaged, and two or three of the species are somewhat difficult to determine owing to the close resemblance between them. The species of this genus occur in carcases, rubbish, etc., and this particular species is very widely spread.

It is impossible to imagine that the ground beetles and also the Staphylinids could have reached these remote islands since they were separated from the mainland, and they must be the survivors of species living on this particular spot when these islands were separated from the nearest point on the mainland.

THE UNIVERSITY, EDINBURGH, *December* 1904.

DIPTERA SCOTICA: IV.—ORKNEY AND SHETLAND.

By PERCY H. GRIMSHAW, F.E.S.

SOME months ago the Rev. E. N. Bloomfield, of Guestling Rectory, Hastings, was good enough to send me for examination and determination a number of Diptera collected in the Orkney and Shetland Islands by Dr. O. Reuter, of Helsingfors, Finland, in the summer of 1876. I have thought it advisable, while publishing the results, to include all the records I could find bearing upon the Dipterous fauna of these islands, even although many of those hitherto published still require confirmation and a few of which may be erroneous. By this means it is hoped that all the information bearing upon the subject may be placed in a convenient form for future investigators, while attention will at the same time be drawn by critical remarks to those species whose claim for inclusion in the list rests upon wrong identification or some other doubtful factor.

So far as I am aware, our knowledge of the flies of Orkney and Shetland is limited to the following papers and notes: (1) a paper by W. Armston Vice in the "Scottish Naturalist," vol. ii. (1873-74) pp. 274-276, entitled "Diptera in the North of Scotland"; (2) a second paper by the same author in the "Scottish Naturalist," New Series, vol. i. (1883-84) pp. 9-19, entitled "List of Diptera taken in the North of Scotland, chiefly in the province 'Dee,'" in

which most of the previous records are repeated; (3) a note by C. W. Dale, in the "Ent. Mo. Mag." (2) vol. iv. (1893) p. 93, on "Shetland Diptera"; (4) a short note by the Rev. E. N. Bloomfield, in the same journal (1904, p. 88), on "Diptera from the Shetlands and Orkneys," collected by the Rev. F. D. Morice; and (5) a reference to a species of "Cecidomyia" by Prof. J. W. Trail in the "Scottish Naturalist," New Series, vol. iii. (1887-88) pp. 309-328.

In the following list all previous records are, for the sake of brevity, referred to under the numbers given in the preceding paragraph, while it is to be understood that all those without such reference were collected by Dr. Reuter, and for the identification of which I alone am responsible.

I.—ORKNEY.

Family CECIDOMYIIDÆ.

1. DASYNEURA URTICÆ, *Perris.*—[*Cecidomyia*] Orkney, Trail, 5.

Family MYCETOPHILIDÆ.

2. MACROCERA VITTATA, *Mg.*—One, Kirkwall, 5th July.

Family SIMULIIDÆ.

3. SIMULIUM NANUM, *Ztt.*—1 ♂, Ophir, 17th July.

Family CHIRONOMIDÆ.

4. TANYPUS NEBULOSUS, *Mg.*—One, Kirkwall, 20th July.

Family TIPULIDÆ.

5. TIPULA OLERACEA, *L.*—1 ♂, Kirkwall, 14th July.

Family STRATIOMYIDÆ.

6. CHLOROMYIA FORMOSA, *Scop.*—1 ♀, Orkney.
7. MICROCHRYSA CYANEIVENTRIS, *Ztt.*—1 ♂, Orkney.

Family TABANIDÆ.

8. HAEMATOPOTA PLUVIALIS. *L.*—1 ♀, Kirkwall, 15th July; 1 ♀, Stromness, 21st July.

Family LEPTIDÆ.

9. CHRYSOPILUS AURATUS, *Fab.*—2 ♀♀, Kirkwall, 15th July; 4 ♂♂ and 1 ♀, Orkney.

Family EMPIDÆ.

10. Cyrtoma spuria, *Fln.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

11. Rhamphomyia variabilis, *Fln.*—Between Kirkwall and Stromness, August, 1873—Vice, 1; Orkney—Vice, 2.

12. Rhamphomyia flava, *Fln.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

13. Empis tessellata, *Fab.*—Between Kirkwall and Stromness, August 1873—Vice, 1; 1 ♀, Kirkwall, 14th July; 2 ♂ ♂, Kirkwall, 15th July; ♂ and ♀, Orkney.

14. Empis stercorea, *L.*—1 ♂, Kirkwall, 15th July.

15. Empis punctata, *Mg.*—1 ♀, Ophir, 17th July; 1 ♀, Orkney.

16. Hilara chorica, *Fln.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

[Hilara, *spp.*—1 ♂, and 2 ♀ ♀, Kirkwall, 5th July.]

17. Heleodromia fontinalis, *Hal.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

18. Hemerodromia precatoria, *Fln.*—[*monostigma*] Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

19. Tachista arrogans, *L.*—One specimen, Orkney.

[Tachydromia, *spp.*—1 ♂, and one ♀, Kirkwall, 14th July; 1 ♂, Kirkwall, 19th July; 1 ♀, Kirkwall, 20th July; 1 ♀, Stromness, 20th July; 1 ♂, Stromness, 21st July; 1 ♂, Orkney.]

Family DOLICHOPODIDÆ.

20. Dolichopus atripes, *Mg.*—1 ♀, Ophir, 17th July.

21. Dolichopus vitripennis, *Mg.*—1 ♀, Ophir, 17th July; 1 ♂, Stromness, 21st July.

22. Dolichopus plumipes, *Scop.*—3 ♂ ♂ and 1 ♀ Kirkwall, 5th July; 1 ♀, Kirkwall, 19th July; 1 ♂, Orkney.

23. Dolichopus griseipennis, *Stann.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; 1 ♀, Kirkwall, 15th July; 1 ♂, Ophir, 17th July; 1 ♂, Kirkwall, 20th July; 1 ♂, Stromness, 21st July.

24. Dolichopus ungulatus, *L.*—1 ♀, Orkney; 2 ♂ ♂, and 3 ♀ ♀, Kirkwall, 5th July.

25. Dolichopus rupestris, *Hal.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice 2.

26. ARGYRA ARGENTINA, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; 1 ♂, Kirkwall, 15th July; 1 ♂, Ophir, 17th July.

27. SYNTORMON PUMILUS, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

28. SYNTORMON PALLIPES, *Fab.*—[*Synarthrus*] Between Kirkwall and Stromness, August 1873,—Vice, 1; two specimens, Kirkwall, 20th July.

29. CAMPSICNEMUS CURVIPES, *Fln.*—Between Kirkwall and Stromness, August 1873—Vice, 1.

30. SYMPYCNUS ANNULIPES, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice 1; Orkney—Vice 2.

Family LONCHOPTERIDÆ.

31. LONCHOPTERA PUNCTUM, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

Family PIPUNCULIDÆ.

32. PIPUNCULUS CAMPESTRIS, *Ltr.*—1 ♂, Kirkwall, 5th July.

Family SYRPHIDÆ.

33. CHRYSOGASTER HIRTELLA, *Lw.*—[*viduata*] Between Kirkwall and Stromness, August 1873—Vice, 1; [*viduata*] Orkney—Vice, 2; ♂ and ♀, Ophir, 17th July; ♀, Orkney.

34. CHILOSIA ILLUSTRATA, *Harr.*—Orkney, 14th September 1894—Bloomfield, 4.

35. PLATYCHIRUS MANICATUS, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; 1 ♀, Kirkwall, 14th July; ♂ and ♀, Orkney.

36. PLATYCHIRUS PELTATUS, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; Orkney, 14th September 1894—Bloomfield, 4; 1 ♂, Ophir, 17th July.

37. PLATYCHIRUS ALBIMANUS, *Fab.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; 1 ♀, Stromness, 20th July.

38. PLATYCHIRUS CLYPEATUS, *Mg.*—1 ♂, Kirkwall, 15th July; 1 ♂, Ophir, 17th July; 1 ♀, Orkney.

39. PLATYCHIRUS ANGUSTATUS, *Ztt.*—1 ♂, Orkney.

40. Melanostoma mellinum, *L.*—1 ♀, Ophir, 17th July.
[Leucozona lucorum, *L.*—Orkney — Vice, 2. Mr. Bloomfield informs me that this record is erroneous. Still there is no reason why the species should not occur.—P. H. G.]

41. Syrphus ribesii, *L.*—1 ♀, Kirkwall, 19th July.

42. Syrphus vitripennis, *Mg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

43. Syrphus balteatus, *Deg.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

44. Sphærophoria menthastri, *L.* — Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

45. Ascia podagrica, *Fab.*—1 ♀, Kirkwall, 5th July; 2 ♂♂, Kirkwall, 15th July.

46. Ascia floralis, *Mg.*—1 ♀, Kirkwall, 5th July, with an entirely black abdomen.

47. Rhingia campestris, *Mg.*—[*rostrata*] Between Kirkwall and Stromness, August 1873 — Vice, 1; Orkney — Vice, 2; 1 ♂, Kirkwall, 5th July; 1 ♂, Kirkwall, 15th July.

48. Volucella bombylans, *L.*—1 ♀, Kirkwall, 15th July; 1 ♀, Stromness, 20th July; 1 ♀, Stromness, 21st July.

49. Volucella pellucens, *L.*—[*inflata*] Very abundant between Kirkwall and Stromness, August 1873—Vice, 1.

50. Eristalis arbustorum, *L.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; 1 ♀, Stromness, 20th July.

51. Eristalis nemorum, *L.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2. [The occurrence of this species seems to me to require confirmation—very probably Vice's specimens were only *arbustorum*, L.—P. H. G.]

52. Helophilus pendulus, *L.*—Between Kirkwall and Stromness, August 1872—Vice, 1; Orkney—Vice, 2; Orkney, 14th September 1894—Bloomfield, 4.

53. Syritta pipiens, *L.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2.

54. Sericomyia borealis, *Fln.*—Between Kirkwall and Stromness, August 1873—Vice, 1; Orkney—Vice, 2; Orkney, 14th September 1894—Bloomfield, 4.

55. Sericomyia lappona, *L.*—Between Kirkwall and Stromness, August 1873—Vice, 1. [Mr. Bloomfield informs me that Vice only *saw* what he took to be this species, and that very probably the specimen was only *borealis*.—P. H. G.]

Family TACHINIDÆ.

56. Micropalpus vulpinus, *Fln.*—[*Tachina*] Between Kirkwall and Stromness, August 1873—Vice, 1; [*Tachina*] Orkney—Vice, 2.

57. Rœselia antiqua, *Fln.*—Among Dr. Reuter's specimens I found a single example of this interesting species labelled "Orkney."—P. H. G.

58. Digonochæta spinipennis, *Mg.*—[*Tachina*] Between Kirkwall and Stromness, August 1873—Vice, 1.

59. Cynomyia mortuorum, *L.*—In September this year Mr. W. Eagle Clarke captured 2 ♀ ♀ at Stennes.

Family MUSCIDÆ.

60. Musca domestica, *L.*—1 ♀, Kirkwall, 19th July.

61. Morellia simplex, *Lw.*—1 ♀, Kirkwall, 19th July.

Family ANTHOMYIIDÆ.

62. Polietes lardaria, *Fab.*—[*Anthomyia*] Between Kirkwall and Stromness, August 1873—Vice, 1.

63. Hyetodesia incana, *Wied.*—1 ♂, Kirkwall, 15th July; 1 ♂, Kirkwall, 19th July.

64. Mydæa impuncta, *Fln.*—1 ♂, Kirkwall, 14th July; 1 ♀, Kirkwall, 15th July; 1 ♂ and 1 ♀, Ophir, 17th July. [All the Orkney specimens have only 3 post-sutural dorsocentral bristles; otherwise there is no difference between them and typical specimens. As I possess examples of *M. impuncta* with both 3 and 4, all from the same locality, I cannot safely refer Dr. Reuter's specimens to any other species, such as *demigrans*, Ztt.—P. H. G.]

65. Hydrotæa dentipes, *Fab.*—1 ♂, Kirkwall, 15th July.

66. Drymia hamata, *Fln.*—1 ♂, Kirkwall, 19th July.

67. Homalomyia canicularis, *L.*—1 ♀, Kirkwall, 5th July.

68. Homalomyia, *sp.*—1 ♀, Ophir, 17th July.

69. Azelia macquarti, *Stæg.*—1 ♂, Kirkwall, 15th July.

70. Azelia cilipes, *Hal.*—1 ♂, Ophir, 17th July.

71. Caricea tigrina, *Fab.*—1 ♂, Kirkwall, 14th July; 1 ♀, Kirkwall, 19th July; 1 ♂, Stromness, 21st July.

Family CORDYLURIDÆ.

72. Scatophaga lutaria, *Fab.*—1 ♂, Kirkwall, 20th July.

73. Scatophaga stercoraria, *L.*—3 ♂ ♂, Kirkwall, 19th July; 1 ♀, Stromness, 21st July.

74. Scatophaga litorea, *Fln.*—1 ♂, Ophir, 17th July; 2 ♀ ♀, Kirkwall, 19th July.

75. Scatophaga villipes, *Ztt.*—2 ♂ ♂, Kirkwall, 14th July. [Although this species has long been doubted as a British species, yet I have no hesitation in referring the present examples to it, although they do not quite agree with the descriptions given by Zetterstedt, Becker, and others. They *cannot* be anything else, and I feel sure *villipes* is a variable species, at any rate as regards the colour of the legs.—P. H. G.]

Family PHYCODROMIDÆ.

76. Orygma luctuosum, *Mg.*—1 ♂ and 1 ♀, Kirkwall, 14th July.

77. Fucomyia, *sp.*—1 ♀, Kirkwall, 14th July; 1 ♂, Kirkwall, 19th July. [My knowledge of this peculiar genus is not sufficient to enable me to identify Dr. Reuter's specimens with certainty.—P. H. G.]

Family SCIOMYZIDÆ.

78. Œdoparea buccata, *Fln.*—1 ♀, Ophir, 17th July; 1 ♀, Kirkwall, 19th July; 2 ♂ ♂, Stromness, 21st July.

79. Phæomyia fuscipennis, *Mg.*—1 ♂, Kirkwall, 5th July.

80. Tetanocera lævifrons, *Lw.*—1 ♀, Kirkwall, 15th July.

81. Tetanocera ferruginea, *Fln.*—1 ♀, Ophir, 17th July.

82. Tetanocera coryleti, *Scop.*—1 ♂, Ophir, 17th July.

83. Elgiva albiseta, *Scop.*—1 ♂, Stromness, 21st July.

Family PSILIDÆ.

84. Psila? pectoralis, *Mg.*—One specimen, Stromness, 20th July.

85. Loxocera aristata, *Pz.*—1 ♂, Kirkwall, 5th July; 1 ♂, Kirkwall, 15th July; 2 ♂ ♂, Stromness, 21st July. *Var. yerburyi*, Aust.—1 ♂ and 2 ♂ ♂, Kirkwall, 15th July; 1 ♂, Stromness, 21st July.

Family ORTALIDÆ.

86. PTEROPÆCTRIA FRONDESCENTIÆ, *L.*—1 ♂ and 1 ♀, Kirkwall, 5th July.

Family TRYPETIDÆ.

87. UROPHORA SOLSTITIALIS, *L.*—2 ♂ ♂, Orkney.

Family LONCHÆIDÆ.

88. PALLOPTERA UMBELLATARUM, *Fab.*—1 ♀, Kirkwall, 20th July.

89. PALLOPTERA ARCUATA, *Fln.*—1 ♂, Kirkwall, 15th July.

Family SAPROMYZIDÆ.

90. LAUXANIA ÆNEA, *Fln.*—Kirkwall, one, 15th July, and one, 19th July.

Family OPOMYZIDÆ.

91. BALIOPTERA COMBINATA, *L.*—Kirkwall, one, 5th July, and one, 14th July.

92. OPOMYZA GERMINATIONIS, *L.*—1 ♀, Orkney.

Family SEPSIDÆ.

93. NEMOPODA CYLINDRICA, *Fab.*—1 ♂, Kirkwall, 15th July; 1 ♀, Stromness, 20th July; 1 ♀, Stromness, 21st July.

Family EPHYDRIDÆ.

94. HYDRELLIA GRISEOLA, *Fln.*—one, Ophir, 17th July.

95. PARHYDRA, *sp.*—one specimen near *quadripunctata*, Mg., Orkney.

96. SCATELLA QUADRATA, *Fln.*—one, Kirkwall, 19th July.

Family DROSOPHILIDÆ.

97. DROSOPHILA, *sp.*—one in bad condition, Kirkwall, 15th July.

Family CHLOROPIDÆ.

98. MEROMYZA SALTATRIX, *L.*—♀, Orkney.

99. CHLOROPS ? SPECIOSA, *Mg.*—one, Kirkwall, 15th July; one, Stromness, 20th July.

100. OSCINIS FRIT, *L.*—one, Kirkwall, 19th July.

Family AGROMYZIDÆ.

101. AGROMYZA PUSILLA, *Mg.*—one, Orkney.

Family BORBORIDÆ.

102. BORBORUS EQUINUS, *Fln.*—1 ♀, Orkney.

103. SPHÆROCERA SUBSULTANS, *Fab.*—one, Kirkwall, 19th July.

104. SPHÆROCERA, *sp.*—one, Kirkwall, 14th July.

105. LIMOSINA FONTINALIS, *Fln.*—one, Stromness, 20th July.

106. LIMOSINA, *sp.*—Kirkwall, one, 14th July, and one, 15th July.

Family PHORIDÆ.

107. TRINEURA STICTICA, *Mg.*—one, Kirkwall, 19th July; one Kirkwall, 20th July.

II. SHETLAND.

Family BIBIONIDÆ.

1. SCATOPSE PULICARIA, *Lw.*—one, Lerwick, 6th July.

2. DILOPHUS FEMORATUS, *Mg.*—June 1890—Dale, 3. [This requires confirmation.—P.H.G.]

Family CHIRONOMIDÆ.

3. CHIRONOMUS PALLENS, *Mg.*—June 1890—Dale, 3.

4. CHIRONOMUS HISTRIO, *Fab.*—June 1890—Dale, 3.

5. CRICOTOPUS FESTIVUS, *Mg.*—[*Chironomus*] June 1890—Dale, 3. [Not yet proved to be a British species—its occurrence in Shetland requires confirmation.—P.H.G.]

6. ORTHOCLADIUS DOLENS, *Wlk.*—[*Chironomus*] June 1890—Dale, 3.

7. TANYPUS FERRUGINEICOLLIS, *Mg.*—June 1890—Dale, 3.

8. CERATOPOGON FEMORATUS, *Mg.*—June 1890—Dale, 3.

Family CULICIDÆ.

9. CULEX PIPIENS, *L.*—[*ciliaris*] June 1890—Dale, 3.

Family PTYCHOPTERIDÆ.

10. PTYCHOPTERA ALBIMANA, *Fab.*—1 ♂, Shetland.

Family LIMNOBIIDÆ.

11. Molophilus ochraceus, *Mg.*—[*Erioptera*] June 1890—Dale, 3.

12. Molophilus obscurus, *Mg.*—[*Mololophilus*!] June 1890—Dale, 3.

13. Rhypholophus lineatus, *Mg.*—[*Erioptera*] June 1890—Dale, 3.

14. Rhypholophus nodulosus, *Mcq.*—[*Erioptera*] June 1890—Dale, 3.

15. Erioptera trivialis, *Mg.*—June 1890—Dale, 3.

16. Limnophila meigenii, *Verr.*—June 1890—Dale, 3.

17. Pedicia rivosa, *L.*—June 1890—Dale, 3.

FAMILY TIPULIDÆ.

18. Tipula rufina, *Mg.*—June 1890—Dale, 3.

19. Tipula longicornis, *Schum.*—June 1890—Dale, 3.

20. Tipula oleracea, *L.*—June 1890—Dale, 3.

21. Tipula fascipennis, *Mg.*—[*fuscipennis*] June 1890—Dale, 3.

Family RHYPHIDÆ.

22. Rhyphus punctatus, *Fab.*—1 ♂, Lerwick, 6th July.

23. Rhyphus fuscatus, *Fab.*—[*fasciatus*] June 1890—Dale, 3. [If this is the species meant by Dale, it requires confirmation.—P.H.G.]

Family EMPIDÆ.

24. Cyrtoma spuria, *Fln.*—June 1890—Dale, 3.

25. Empis tessellata, *Fab.*—1 ♂, Shetland.

26. Empis stercorea, *L.*—June 1890—Dale, 3.

27. Clinocera nigra, *Mg.*—1 ♂, Bressay, 10th July.

28. Heleodromia fontinalis, *Hal.*—1 ♀, Tingwall, 7th July.

29. Hemerodromia precatoria, *Fln.*—June 1890—Dale, 3 [recorded also (*l.c.*) as *H. monostigma*]; 2 ♀ ♀, Bressay, 10th July.

30. Tachydromia, *sp.*—1 ♀, Tingwall, 7th July.

Family DOLICHOPODIDÆ.

31. Dolichopus nubilus, *Mg.*—1 ♂, Tingwall, 7th July; 1 ♀, Bressay, 10th July.

32. Dolichopus discifer, *Stan.*—3 ♂ ♂, Tingwall, 7th July.

33. Dolichopus plumipes, *Scop.*—2 ♂ ♂ and 4 ♀ ♀, Lerwick, 6th July; 3 ♂ ♂ and 4 ♀ ♀, Tingwall, 7th July; 1 ♀, no date.

34. Dolichopus festivus, *Hal.*—June 1890—Dale, 3.

35. Syntormon pallipes, *Fab.*—[*Porphyrops*] June 1890—Dale, 3; two, Lerwick, 6th to 9th July; one, Tingwall, 7th July; one, Bressay, 10th July.

Family SYRPHIDÆ.

36. Liogaster metallina, *Fab.*—[*Chrysogaster*] June 1890—Dale, 3; 2 ♀ ♀, Lerwick, 6th July; 1 ♀, Lerwick, 8th to 9th July.

37. Chrysogaster hirtella, *Lw.*—1 ♂, Tingwall, 7th July.

38. Chilosia albitarsis, *Mg.*—[*flavimana*] June 1890—Dale, 3.

39. Platychirus manicatus, *Mg.*—June 1890—Dale, 3; 1 ♂, and 2 ♀ ♀, Lerwick, 6th July; 1 ♂, Lerwick, 8th to 9th July; 1 ♀, Shetland.

40. Platychirus peltatus, *Mg.*—June 1890—Dale, 3.

41. Melanostoma mellinum, *L.*—1 ♂, and 1 ♀, Tingwall, 7th July.

42. Syrphus corollæ, *Fab.*—Unst and Lerwick, 27th August to 13th September 1894—Bloomfield, 4.

43. Rhingia campestris, *Mg.*—June 1890—Dale, 3; 2 ♂ ♂, and 3 ♀ ♀, Bressay, 10th July.

44. Eristalis intricarius, *L.*—June 1890—Dale, 3.

45. Eristalis arbustorum, *L.*—June 1890 —Dale, 3; Unst and Scalloway, 27th August to 13th September 1894—Bloomfield, 4; 1 ♂, Lerwick, 6th July.

46. Eristalis nemorum, *L.*—June 1890—Dale, 3. [I should like to see this record confirmed.—P.H.G.]

47. Helophilus pendulus, *L.*—Unst and Lerwick, 27th August to 13th September 1894—Bloomfield, 4.

48. Syritta pipiens, *L.*—1 ♂, Lerwick, 6th July.

49. Sericomyia borealis, *Fln.*—Lerwick, 27th August to 13th September 1894—Bloomfield, 4; 1 ♂, Shetland.

Family TACHINIDÆ.

50. Siphona geniculata, *Deg.*—1 ♀, Lerwick, 6th July.

51. Onesia sepulchralis, *L.*—1 ♂, Lerwick, 6th July; 1 ♀, Shetland.

Family MUSCIDÆ.

52. Hæmatobia stimulans, *Mg.*—[*Stomoxys*] June 1890—Dale, 3.

53. Morellia simplex, *Lw.*—One unusually large ♀, Lerwick, 6th July.

54. Euphoria cornicina, *Fab.*—1 ♀, Lerwick, 6th July; 1 ♂, Shetland.

Family ANTHOMYIIDÆ.

55. Hyetodesia incana, *Wied.*—June 1890—Dale, 3; 2 ♀ ♀, Lerwick, 6th July; 1 ♀, Tingwall, 7th July; 2 ♀ ♀, Bressay, 10th July.

56. Hyetodesia longipes, *Ztt.*—June 1890—Dale, 3; 1 ♀, Tingwall, 7th July.

57. Spilogaster duplicata, *Mg.*—June 1890—Dale, 3; 2 ♂ ♂, Lerwick, 6th July.

58. Spilogaster quadrum, *Fab.*—June 1890—Dale, 3.

59. Spilogaster scrupulosa, *Ztt.*—[*Cœnosia*] June 1890—Dale, 3. [This should be confirmed.—P.H.G.]

60. Limnophora triangula, *Fln.*—[*Cœnosia*] June 1890—Dale, 3.
[Limnophora obscuripes, *Ztt.*—[*Spilogaster*] June 1890—Dale, 3. This is not yet recognised as British, and requires confirmation.—P.H.G.]

61. Hydrotæa irritans, *Fln.*—1 ♀, Lerwick, 6th July; 1 ♂, Shetland.

62. Hylemyia variata, *Fln.*—June 1890—Dale, 3.

63. Mycophaga fungorum, *Deg.*—[*Mycetophaga*!] June 1890—Dale, 3.

64. Homalomyia scalaris, *Fab.*—June 1890—Dale, 3.

65. Homalomyia canicularis, *L.*—June 1890—Dale, 3.

66. Homalomyia, *spp.*—3 ♀ ♀, not determined, Tingwall, 7th July.

67. Azelia macquarti, *Staeg.*—1 ♂, Lerwick, 6th July.

68. Azelia cilipes, *Hal.*—1 ♂, Tingwall, 7th July; 1 ♂, Shetland.

69. Caricea tigrina, *Fab.*—2 ♂ ♂, and 7 ♀ ♀, Lerwick, 6th July; 2 ♂ ♂, Shetland.

70. Hoplogaster mollicula, *Fln.*—2 ♂ ♂, and 1 ♀, Bressay, 10th July.

Family CORDYLURIDÆ.

71. Norellia spinimana, *Fln.*—[*Cordylura*] June 1890—Dale, 3.

72. Scatophaga stercoraria, *L.*—June 1890—Dale, 3; 2 ♂ ♂, and 2 ♀ ♀, Lerwick, 6th July; 1 ♀, Shetland.

73. Scatophaga squalida, *Mg.*—June 1890—Dale, 3; 2 ♂ ♂, Tingwall, 7th July; 1 ♂, Bressay, 10th July.

74. Scatophaga litorea, *Fln.*—June 1890—Dale, 3; 2 ♀ ♀, Lerwick, 6th July; 1 ♀, Bressay, 10th July.

75. Scatophaga villipes, *Ztt.*—one undoubted ♂, Tingwall, 7th July.

Family PHYCODROMIDÆ.

76. Fucomyia frigida, *Fln.*—[*Cœlopa*] June 1890—Dale, 3.

77. Fucomyia parvula, *Hal.*—[*Cœlopa*] June 1890—Dale, 3.

78. Fucomyia, *spp.*—2 ♂ ♂ and 2 ♀ ♀, Lerwick, 6th July, all undetermined. [See remarks under this species in the Orkney List.]

Family SCIOMYZIDÆ.

79. Tetanocera lævifrons, *Lw.*—1 ♂, Shetland.

Family ORTALIDÆ.

80. Pteropæctria frondescentiæ, *L.*—3 ♂ ♂, 1 ♀, Bressay, 10th July.

Family SAPROMYZIDÆ.

81. Lauxania ænea, *Fln.*—Shetland.

Family OPOMYZIDÆ.

82. Balioptera tripunctata, *Fln.*—1 ♂, Tingwall, 7th July.

83. Balioptera combinata, *L.*—Two specimens, Tingwall, 7th July.

84. Opomyza germinationis, *L.*—3 ♂ ♂ and 2 ♀ ♀, Lerwick, 6th July.

Family PIOPHILIDÆ.

85. Piophila casei, *L.*—1 ♂, Lerwick, 6th July; 1 ♀, Tingwall, 7th July.

Family GEOMYZIDÆ.

86. Anthomyza gracilis, *Fln.*—One specimen, Shetland.

Family EPHYDRIDÆ.

87. Notiphila cinerea, *Fln.*—One specimen, Lerwick, 6th July; one, Tingwall, 7th July; three, Bressay, 10th July.

88. Hydrellia griseola, *Fln.*—Two, Tingwall, 7th July.

89. Hydrellia chrysostoma, *Mg.*—Three, Tingwall, 7th July; one, Shetland.

90. Hydrellia ranunculi, *Hal.*—Four, Tingwall, 7th July; one, Shetland.

91. Parhydra, *sp.* (near *quadripunctata*, Mg.)—One, Shetland.

92. Ilythea spilota, *Hal.*—one, Tingwall, 7th July.

Family CHLOROPIDÆ.

93. Centor cereris, *Fln.*—1 ♂, Shetland.

94. Chlorops ? speciosa, *Mg.*—One, Lerwick, 6th July.

95. Oscinis frit, *L.*—Three, Tingwall, 7th July.

Family AGROMYZIDÆ.

96. Agromyza obscurella, *Fln.*—One, Bressay, 10th July.

Family PHYTOMYZIDÆ.

97. Napomyza lateralis, *Fln.*—One, Lerwick, 6th July; one, Tingwall, 7th July.

98. Chromatomyia obscurella, *Fln.*—One, Shetland.

Family BORBORIDÆ.

99. Borborus nitidus, *Mg.*—1 ♂ and 3 ♀ ♀, Lerwick, 6th July; 1 ♂, Tingwall, 7th July; 1 ♀, Lerwick, 8th to 9th July.

100. Borborus equinus, *Fln.*—June 1890—Dale, 3; 1 ♂, Lerwick, 6th July, also a small ♂ and ♀ on same pin which I can only refer to this species.

101. Limosina, *sp.*—One, Lerwick, 6th July.

Royal Scottish Museum, Edinburgh.

CONTRIBUTIONS TOWARD A FLORA OF CAITHNESS. No. IV.

By Arthur Bennett, F.L.S.

(*Continued from p.* 233, *No.* 52.)

Gentiana baltica, *Murbeck.*—Reay, Keiss Links, J. Grant.

G. campestris, *L.*—Dunnet, "Scot. Alp. Club."

G. Amarella, *L.*,* axillaris, *Murbeck.* — Reay Links, E. S. Marshall, *sp.*

Menyanthes trifoliata, *L.*—Near Dunnet, "Scot. Alp. Club."

Symphytum tuberosum, *L.*—High bank of the Wick River, between three and four miles above the town (Sibster to Ingbister), very scarce, but apparently a true native, and remote from houses, E. S. Marshall, *sp.*

Myosotis palustris, *L.*—Wick River near Wick, Dr. Ward, *sp.*

M. strigulosa, *M. et K.*—Junction of the Milton Burn with the Wick River, very fine specimens, J. Grant, *sp.*

M. repens, *D. Don.*—Burn at Dunnet, W. F. Miller.

M. arvensis, *Willd.*, var. gracilis, *V. Bosch.* (sub. *intermedia*, Link). — Field, west of Wick, 6th July, 1886, E. S. Marshall, *sp.*

Lycopsis arvensis, *L.*—Dunnet to Brough, "Scot. Alp. Club," 1889.

†Linaria purpurea, *L.*—Nicolson's Cat., 1904.

Digitalis purpurea, *L.*—Reay Hills, R. Dick; near Sibster and elsewhere on the Wick River, J. Grant.

Mimulus luteus, *L.*—One at least of the Caithness plants seems to be referable to M. langsdorffii, *Donn.*

Veronica arvensis, *L.*, var. eximia, *Towns.*—Grassy cliff near Dunnet Sands, E. S. Marshall.

V. Anagallis, *L.*—Dunnet, "Scot. Alp. Club."

V. Buxbaumii, *Ten.*—The Glebe, Wick, J. Grant.

V. hederifolia, *L.*—With last.

V. scutellata, *L.*—The Wick River and Castleton specimens are the usual state of the species, except that they are smaller than southern examples.

Bartsia Odontites, *Huds.*—Reay, W. F. Miller, *sp.* The simple state of the species, but not *littoralis.*

Rhinanthus Christa-galli, *L.*, var. angustifolius, *Koch.* (= *R. stenophyllus*, Schur.).—Thurso and Wick Rivers, Grant, *sp.* On the sea-cliffs at Freswick a small unbranched form occurs, with the leaves appressed to the stem.

R. Christa-galli, *L.*—Isle of Stroma, Miss Geldart.

Pinguicula vulgaris, *L.*—Dirlot, R. Dick. Dunnet to Brough, "Scot. Alp. Club," 1889.

Utricularia vulgaris, *L.*—Mr. Nicolson marks this with doubt as a Caithness plant. It grows in Shetland !, Orkney, and the Outer Hebrides. In Scandinavia the distribution is almost continuous. In Finland and Russian Lapland it is wanting only from the five northern provinces, *i.e.* from 67° N. lat. In Arctic Norway it extends to 70° (unless the plant there is *A. neglecta*. It is probably *vulgaris*, though Norman[1] marks it as doubtful, which occurs.)

Euphrasia brevipila, *Burn. and Gremli.*—West of Thurso.

E. curta, *Fr.*—Dounreay, H. E. Fox, 1885.

[E. scotica, *Wettst.*—Dr. Trail tells me that the record in "Ann. Scot. Nat. Hist." 97, 1899, is in error, but that he believes the plant occurs in Caithness.]

E. Rostkoviana, *Hayne.*—Reay, E. S. Marshall.

Plantago maritima, *L.*—Plentifully on roadsides at Watten, six miles from nearest sea, A. Sutherland, *sp.*

Prunella vulgaris, *L.*—Reay, W. F. Miller, *sp.*

Lamium intermedium, *Fr.*—Castleton, Reay, Dr. Shoolbred.

L. album, *L.*—Nicolson to H. C. Watson.

Origanum vulgare, *L.*—Brown's Cat. to H. C. Watson.

Stachys arvensis, *L.*—Castleton in cornfields, Druce, *l.c.*

Ajuga pyramidalis, *L.*—Berriedale, W. R. Linton, Banks of Thurso River, May 1863, R. Dick; May 1904, R. Lindsay, *sp.*

Marrubium vulgare, *L.*—Common Horehound, Caithness, Mr. A. Sutherland, *sp.*, 1904.

North to Elgin (Gordon) and Dumbarton (Ewing), in Europe wanting only in N. Sweden, Finland, and N. Russia.

Atriplex Babingtonii.—Woods, Proudfoot, Shaltigoe, J. Grant, *sps.* var. virescens, *Lange.*—Duncansby, Miss Geldart!; Freswick Links, J. Grant, *sp.*; Downreay, F. L. Linton!.

[1] "Loc. Nat. Sp. Arct. Nor." 31, 1864.

Polygonum aviculare, *L.*, var. vulgatum, *Syme.*—Tinker's Cove near Wick, J. Grant, *sp.*

var. rurivagum (*Jord.*).—Salt marsh, Wick River, J. Grant, *sp.*

var. littorale (*Link*).—Dunnet Links, Dr. Shoolbred. Salt marshes, Wick River, J. Grant, *sp.*

P. Hydropiper, *L.*—Marked by Mr. Nicolson with doubt as a Caithness species. It occurs in the Outer Hebrides (Duncan, *sp.*); but is not on record from Sutherland, and is doubtfully so for Orkney and Shetland. Extends in Sweden up to Vesterbotten, and occurs in S. Norway. In Finland occurs at Uleäborg (about 65° N. lat.), where it grows with *P. Persicaria*, L.

Hippophaë rhamnoides, *L.*—Reay. "Growing in plenty on the banks of a stream, right-hand side of road, nearest coast between Reay and Thurso, perhaps a mile or more from Reay. Of course it must have originally been planted," Dr. Shoolbred. Yes, it was planted, and Dr. Davidson's report was correct.

Salix aurita, *L.*—Wick River, Watten, J. Grant, *sp.*

S. repens, *L.*—Wick Bay, Watten, J. Grant, *sps.*

Myrica Gale, *L.*—Killimester and Winless mosses, Mr. D. Doull, *sp.* "Purse-wan is its Caithness name; leaves used to kill fleas."

Empetrum nigrum, *L.*—Dunnet to Brough, "Scot. Alp. Club," 1889.

Quercus Robur, *L.*—Caithness is excepted by Dr. Trail; but remains of Oaks have been found in Post Glacial deposits in the county, and on this ground Mr. N. Niven[1] considers it to have been an indigenous species. Mr. S. Laing[2] remarks:—"And although the county was doubtless once covered with a scrubby underwood, I question if trees of sufficient magnitude to form canoes ever existed in sufficient numbers near the seashore or navigable rivers to teach the savages the art of boat-building." In reply to this it may be asked how many of the Peat mosses or Lake marls have ever been worked out? Of course on either side it is negative evidence. No one can tell what may be found if the county were drained as Cambridgeshire has been, where trees *in situ* in five successive forests have occurred in the Fen.[3]

Populus tremula, *L.*, var. glabra.—Dirlot, R. Dick.

Juniperus communis, *L.*—Banks above Wick River, Dr. Shoolbred!.

[1] "Brit. Assoc. Reports," 840, 1901.
[2] "Pre-historic Remains of Caithness," 54, 1866.
[3] "Fenland, Past and Present," 566-571, 1878.

J. NANA, *Willd.*—Duncansbay Head, Herb. Lambert in Herb. Kew!.

ORCHIS MASCULA, *L.*—Thurso River, R. Dick.

O. ERICETORUM, *Linton.*—Isle of Stroma, Miss Geldart; Wick, Bilbster, E. S. Marshall.

O. INCARNATA, *L.*, var. ANGUSTIFOLIA, *Bab.*—Near Wick, E. S. Marshall, *sp.*

O. LATIFOLIA, *L.*, var. BREVIFOLIA, *Reichb.*—Swampy pasture about a mile N. of Bilbster Station; just like the plant of S. E. Ireland. E. S. Marshall, *sp.*

HABENARIA CONOPSEA, *Benth.*—Scrabster, W. F. Miller.

[H. CHLOROLEUCA, *Ridley.*—In Strath Halladale (W. Sutherland) near the bridge, and not far from the Reay Burn. Dr. Ward. Will probably be found on the Caithness side.]

PARIS QUADRIFOLIA, *L.*—Scouthall, J. Grant, *sp.*

SCILLA VERNA, *Huds.*—First record as a Caithness plant (Lightfoot's "Flora Scotica," 181, 1777, under the name of S. bifolia).

IRIS PSEUDACORUS, *L.*—Brough to Dunnet, "Scot. Alp. Club," 1889; Lysa, J. Grant.

POTAMOGETON ALPINUS, *Balb.*—Loch Yarehouse, J. Grant, *sp.*

P. NITENS, *Weber.*—Mill Dam, Thurso, Dr. Shoolbred.

P. CRISPUS, *L.*—With the last.

P. PECTINATUS, *L.*—Loch Wester and old quarries, J. Grant.

P. FILIFORMIS, *Pers.*—Yarrows Loch, Dr. Ward, *sp.*; Wick River, J. Grant, *sp.*

JUNCUS BALTICUS, *Willd.*—Between Ackergill Tower and Water of Wester, J. Grant.

J. SUPINUS, *Mœnch.*—Watten Loch, D. Lillie, *sp.*

J. ACUTIFLORUS, *Ehrh.*—Watten Loch, D. Lillie, *sp.*

LUZULA ERECTA, *Desv.*—Moors near Forss Water, Dr. Ward, *sp.*

L. SPICATA, *DC.*—Accepted by Watson on faith of R. Brown of Campst Cat., also named by him in "Edin. Trans." As this occurs with *Juncus trifidus*, L., in the Outer Hebrides at the height of 1807 ft. (Duncan, *sps.*), and in Shetland at 1400 ft. (Beeby, *sp.*), there is no reason against its being a Caithness plant. Neither *L. spicuta* nor *J. trifidus* is certain for Orkney yet, but the Ward Hill of Hoy (1564 ft.) has *Silene acaulis*, *Arctostaphylos*, *Uva-Ursi*, *A. alpina*, *Vaccinium uliginosum*, *Saxifraga aizoides*, *S. oppositifolia*, *Thalictrum alpinum*, *Saussurea alpina*, *Oxyria reniformis*, *Draba incana*, etc., as

species occurring on it, so that there must be something in the ecological conditions in Orkney that has yet to be studied before the "reason why" can be learnt as to the absence of these two.

L. FORSTERI, *DC.*—The record of this by R. Dick is a puzzle. Yet in the "Supplement" to Nyman's "Consp. Fl. Europ." 314, 1890, it is given from "Scotia" on the authority of Dr. Buchanan, our best authority on the Juncaceæ. I wrote to him, and in his reply he says, "The notice is apparently incorrect, and I have therefore omitted it in the 'Monograph Juncaceæ' (Engl. 1890, xii. p. 79)."

In no sense is it a northern plant, but it is given for the Alps by Dr. Roth.[1] It does not reach Denmark, and although reported for Oldenburg (1823) by Nolte, the plant was a form of *L. pilosus*, Willd.[2] It is given for Ayr in the "Botany of Ayrshire," 1882, by Messrs. Borland, Duncan, and Landsborough.

TYPHA LATIFOLIA, *L.*—Duran, R. Dick, 1863.

TRIGLOCHIN MARITIMUM, *L.*—Near mouth of Wick River, J. Grant.

T. PALUSTRE, *L.*—Watten Loch, D. Lillie, *sp.*; Wick River, J. Grant.

SCIRPUS PALUSTRIS, *L.*—Dunnet to Brough, "Scot. Alp. Club"; Stemster Loch, Watten, D. Lillie, *sp.*

var. MAJOR, *Asch.* and *Graebn.* (*Heleocharis palustris*, var. *β major*, Sonder, "Fl. Hamb. 22, 1851).—Wick River, J. Grant, *sp.*, "2 feet high, spikes 1 inch."

S. UNIGLUMIS, *Link*, var. PUMILA, *Boenn.* — Stroma Isle, Miss Geldart, *sp.* Extensively creeping, with tufts of stems about every two inches, 2-3 inches high, spikes subrotund. I have it like this from W. Cornwall (Scilly Isles, as *S. pauciflorus*, 1876, W. Curnow) and the Outer Hebrides. Marsson, "Fl. New. Vor. Pommern," 512, 1869, mentions that it has been named S. PAUCIFLORUS, *Light.* Dr. A. Blytt (in *Veget. ved. Sognefjord*, 91, 1869) has a sub-sp. *rotundata* of which he says, "I Habitus meget lig *Scirpus pauciflorus*." This may be the same as the above, as the only distinction he gives is "Axene næsten kuglerunde." Ordinary *S. uniglumis* grows among *Carex kattegatensis*, near the variety.

S. PAUCIFLORUS, *Lightf.*—Stemster Loch, D. Lillie, *sp.*; Yarehouse Loch, J. Grant, *sp.*; Wick, W. W. Reeves, *sp.*

S. CÆSPITOSUS, *L.*—Bilbster Moss, D. Lillie, *sp.*

[1] "Add. Consp. Fl. Europ." 40, 1886.
[2] "Prahl. Kr. Fl. Schl.-Holst.," 228, 1890.

S. FLUITANS, *L.* — Pool between Wick and Castleton, E. S. Marshall, *sp.*

S. SETACEUS, *L.*—River near Wick, Dr. Ward!.

S. TABERNÆMONTANI, *Gmel.*—The record for this (109) in "Ann. Scot. Nat. Hist." 33, 1900, Dr. Trail tells me is an error. It occurs in Skye!, and Outer Hebrides (A. Somerville, *sp.*), and will probably prove to be a Caithness species.

ERIOPHORUM VAGINATUM, *L.*—Bilbster Moss, D. Lillie, *sp.*

SCHŒNUS NIGRICANS, *L.*—Banks of the Wick River, J. Grant, *sp.*; near Reay, R. Dick.

[*Carex rupestris*, All.—Marked by Mr. Nicolson, probably in error.]

C. DISTICHA, *Huds.*—Wet meadow north of the Wick River, 1½ miles from Wick, J. Grant, *sp.*

C. ARENARIA, *L.*—Near Sinclair Castle, Dr. Ward, *sp.*; peaty ditch at Reay, plants 2 ft. high, Linton, *sp.*

C. TERETIUSCULA, *Good.*—R. Brown, *l.c.* 329. No locality is given but the record is probably correct as it occurs in W. Sutherland (Miller, *sp.*) and Outer Hebrides (Shoolbred!).

C. GOODENOWII × AQUATILIS.[2]—Wick River, Marshall, *sp.* "Just about intermediate, the parents occur here in company."

C. GOODENOWII, *var.* JUNCELLA, *Fr.*—Myrelundhorn, Wick, D. Lillie, *sp.*; meadow near Wick River, E. S. Marshall, *sp.*

C. AQUATILIS × KATTEGATENSIS (× GRANTII, *Ar. Benn.*).[1] — This plant is probably nearest to *C. halophila*, F. Nyl. "Sp. Fl. Fenn." 2, 22, 1844, which Almquist[2] refers to *C. aquatilis* × *salina* × *cuspidata*, but that has the spikes paler, larger, and the lower part attenuated, with longer peduncles, and has the habit of *aquatilis*, while × *Grantii* has that of *salina*.

C. KATTEGATENSIS, *Fr.*—In July 1897 Mr. Grant and his sister, Miss Grant, kindly made a collection of specimens (under 22 numbers) from various points on the Wick River, from its first appearance to its highest point in the river. These showed how greatly it varies, so much so that I find it impossible to correlate all these forms with continental examples.

In the paper on the station (noted below[3]) of this species I ought to have written a short introductory note, as the paper was given to me by Mr. Grant some years ago, probably

[1] See "Journal of Botany," 273, 1901.
[2] In Hjelt's "Fl. Fenn." 285, 1895.
[3] See "Ann. Scot. Nat. Hist." p. 179-181, 1904.

between 1880 and 1890, so it must be read with the usual allowance for time expired. It would be interesting if the plant could be again traced up the river and any difference noted.

C. PANICEA, *L.*—Near Watten Loch, D. Lillie, *sp.*

C. SADLERI, *Linton.*—Yarehouse, J. Grant, *sp.*, 1885; near Wick, J. Grant, *sp.*, 1881.

C. CAPILLARIS, *L.*—Cliffs near Keiss and Murkle; cliffs at Scrabster, J. Grant.

C. XANTHOCARPA, *Degland.*—Holborn Head, Dr. Shoolbred.

C. FLAVA, *L.*, var. LEPIDOCARPA (*Tausch.*).—Near Wick River, three miles up, E. S. Marshall.

?C. EXTENSA, *Good.*—"Caithness, Dr. Davidson, *sp.*" is a note I have, but I cannot find the specimen. It occurs in Outer Hebrides (Duncan, *sp.*) and W. Sutherland (Miller, *sp.*).

C. RIPARIA, *Curtis.*—See "Annals," 1904, p. 250.

C. ROSTRATA, *Stokes.*—Grows with *C. pulicaris*, L., and *C. fulva*, Good, at Watten, D. Lillie, *sps.*

PHALARIS ARUNDINACEA, *L.*—Near Stemster Loch, D. Lillie, *sp.*

HIEROCHLOE BOREALIS, *Gmel. ex Ludwig.*—This was gathered by R. Dick in May to June 1834, but remained unrecorded for twenty years.

AGROSTIS VULGARIS, *var.* PUMILA (*L.*).—Near Wick, Dr. Shoolbred.

A. CANINA, *L.*, var.—Grassy places near Holborn Head, E. S. Marshall.

DEYEUXIA NEGLECTA, *Kunth* (= CALAMAGROSTIS STRICTA, *Nutt.*—Smallest Close Reed, Narrow Small-reed, Small Reed-grass).—Near Lochside, Castleton, August 1902, found associated with *Galium uliginosum*, etc., Messrs. Shoolbred and Druce, "Journal of Botany," 406, 1903; and "Ex. Club Report," 62, 1902 (1903). The *D. borealis* (a var. of *neglecta*) found by Mr. G. C. Druce in Perthshire having become extinct,[1] Caithness remains the only Scottish county (on present knowledge) in which *D. neglecta* is to be found. It formerly occurred in Forfar in the "White Mire Marsh, a mile from Forfar," where it was discovered by G. Don in 1807; but the marsh having been drained, the plant was lost. Another station is given by Hooker, "Brit. Fl.," 32, 1830, "near Rescobie, four miles from Forfar, T. Drummond"; but I know of no specimens thence. It is probable that the naming of Caithness specimens

[1] "Journal of Botany," 491, 1897.

as "*C. stricta*, Nutt," by Prof. H. Balfour was correct (see "Annals," 252, 1892), perhaps they are in the Edinburgh Herbarium? This species occurs throughout Scandinavia under the type and eight varieties, and one of the puzzles of Scottish Botany is—why more of the genus do not occur in Scotland?

Aira præcox, *L.*—Near Loch Winless, Fox and Hanbury; Dunnet Links, J. Grant, *sp.*

Deschampsia cæspitosa, *Beauv.*—Wet places on Ackergill Links, W. W. Reeves, *sp.*

D. flexuosa, *Trin.*—Upper Glebe on the Wick River, J. Grant.

[*D. discolor*, R. et S. (*Aira uliginosa*, Weihe, *A. setacea*, Huds).—Will probably be found in Caithness. It occurs in Shetland (Beeby, *sp.*), W. Sutherland (E. F. Linton, *sp.*), E. Sutherland, ("Top. Bot."), and E. Ross (Marshall, *sp.*), and in all three of (102, 103, 104) the Watsonian Inner Hebrides divisions. I have this marked as a Caithness species but cannot trace it, yet I have some idea it was gathered by some one at Loch Watten?.]

Avena pubescens, *Huds.*—Near Wick, Dr. Shoolbred!.

A. fatua, *L.*—Nicolson's Cat. 1904.

Bromus (*asper*) ramosus, *Huds.*—Dirlot, R. Dick.

Elymus arenarius, *L.*—Coast near Reay and Sandside, H. C. Watson; between Dunnet and Castleton, Dr. Shoolbred.

Pteris aquilina, *L.*—Dunnet Head, Heddle herb.!

Lomaria Spicant, *Desv.*—Reay Hills, R. Dick; two miles from Thurso, in sheltered places abundant, R. Dick.

†Cryptogramme crispa, *R. Br.*—R. Brown to H. C. Watson. Seems a curious form to be an escape or alien, it is not easily cultivated. It occurs in the Outer Hebrides and in W. Sutherland.

Asplenium Adiantum-nigrum, *L.*—Dirlot, Reay Hills, R. Dick; rocks above Yarehouse Lochs, J. Grant.

Athyrium Filix-fœmina, *Roth.*—Dirlot, Heddle herb.!

Lastrea Oreopteris, *Presl.*—Morven, R. Dick.

L. Filix-Mas, *Presl.*—Dirlot, R. Dick.

L. dilatata, *Presl.*, var. dumetorum, *Moore.*—"Caithness," Moore.

Phegopteris Dryopteris, *Fée.*—Reay Hills, R. Dick.

P. polypodioides, *Fée.*—Morven, Reay Hills, R. Dick.

P. CALCAREA, *Fée* (*Polypodium Robertianum*, Hoffm.).—Morven, R. Dick, Smiles' "Life of Robert Dick," 297, 1878. In Sweden it occurs in Dalerne, Oland, Ostrogothia, and Gotland; in Norway, in Finland, very rare.

Dr. White says—"I am inclined to think that the species may be indigenous in Perthshire, though the opposite opinion may be reasonably entertained."[1] The only other Scottish reported counties are "Aberdeen, N. error?" and S. Aberdeen, a very doubtful native. Thus the evidence is against its occurrence in Caithness; on the other hand, Robert Dick knew the ferns well, and had both the other species by him in plenty to contrast it with; thus I am inclined to accept it with the usual ?.

OSMUNDA REGALIS, *L.*—By the burn a mile east of Dunnet Head Lighthouse, Mr. Dick of Wick, J. Grant. Planted at Reay and Dorrery by R. Dick.

EQUISETUM ARVENSE, *L.*—Thurso River, R. Dick.

E. PRATENSE, *Ehrh.*—Up the Thurso River, R. Dick; between Wick and Castleton, E. S. Marshall, *sp.*

E. LIMOSUM, *Sm.*—Foot of Lysa Hill, J. Grant.

LYCOPODIUM ANNOTINUM, *L.*—Morven, R. Dick.

L. SELAGO, *L.*, var. RECURVUM, *Desv.*—Killimister Moss, D. Doull, *sp.*

L. ALPINUM, *L.*—Ben Dorrery, R. Dick.

SELAGINELLA SELAGINOIDES, *Gray.*—Dunnet to Brough, "Scot. Alp. Club," 1889; Loch Wester, Keiss Links, R. Dick.

ISOETES LACUSTRIS, *L.*—R. Brown, *l.c.*, 329. Marked with doubt by Mr. Nicolson in 1904. Occurs in W. Sutherland (Salmon), Orkney (Somerville, *sp.*), Shetland (Beeby, *sp.*). In Sweden to Gefleborgs län; while *I. echinospora* occurs up to Lapland, and both are distributed nearly all over Finland and Russian Lapland up to 69° 31′ N. lat. (Waino's "La fl. Lap. find.," 89, 1891).

CHARA FRAGILIS, *Desv.*, var. BARBATA, *Gant.*—Pulteney Town Water, J. Grant!.

C. CONTRARIA, *Kuetz.*—Near Wick, J. Grant, *sp.*

C. HISPIDA, *L.*—Downreay, G. C. Druce, *l.c.*, 1902.

C. VULGARIS, *L.*, var. LONGIBRACTEATA, *Kuetz.*—Ditch at Sibster, J. Grant, "Rec. Club," 251, 1881-2 (1883).

NITELLA OPACA AGARDH.—Ditch near the Wick River, E. S. Marshall.

[1] "Fl. Perth," 370, 1898.

Supplementary Note to No. 4.

Mr. Sutherland tells me that Messrs. Bain and Tait, of the Caithness Field Club, have helped him in sending me specimens, hence I desire to name them here.

Scabiosa arvensis, *L.*—Newton, at the edge of a cornfield, near Hempriggs Loch. A. Sutherland, *sp.* Perhaps introduced. It occurs in Buchan, Aberdeenshire.[1] Mr. Watson saw it in Easterness, East Ross, and West Sutherland, but distrusted its nativity there, and in "Cyb. Brit." ii. 32, 1849, he remarks, "The species has probably been introduced through agriculture into the North of Scotland." But though absent in Lapland, it occurs in "Östersunds län"[2] in Sweden, so that it does not seem altogether impossible as a native in North Scotland.

Achillea Millefolium, *L.*, *var.* villosum, *Hartm.*, "Skand. Fl." 1st ed. 1820.—Coast near Scrabster, C. S. Marshall, *sp.* I am unable to see how this differs from the var. *lanatum*, Koch, "Syn. Fl. Germ. et Helv." 1st ed. 1837.

Plantago Coronopus, *L.*, *var.* integrata, *G. et G.*, "Fl. France," ii. 722, 1850.—With viviparous heads, consisting of eighteen to twenty-five leaves, immersed at the base in long white hairs, leaves at base long, and very slightly toothed. Heathy pasture near Reay, 1889, Mr. W. F. Miller!. Mr. Miller has also gathered it on the Isle of Eigg, 1895!.

Carex riparia.—Old bog, a former part of the old burn of the Kirkstones, which has become partially dried up. It also occurs farther down the burn near the Loch of Winless. D. Doull, *sp.*

For the following local names I am indebted to Mr. D. Doull:—

Nymphæa alba, L.—Called "Paps," and eaten, with the petals.

Spergula arvensis, L.—Called "Carsa" or "Carran."

Lotus corniculatus, L.—"Crow's-toes."

Spiræa Ulmaria, L.—Usually called "Mălary tea."

Chrysanthemum segetum, L.—Commonly called "Golans."

[1] Trail, "Fl. Buchan," li. 1902, *ex* "Northern Flora."
[2] Berlin, "Skand. Halföns," xxii. 1876.

Tussilago Farfara.—Commonly called "Dour Dockan."

Prunella vulgaris, L.—Common name "Tea."

Lamium purpureum, L.—Called "Long-tongue."

Plantago lanceolata, L.—Used by school-boys for a game called "Sodgers" (Soldiers).

Rumex Acetosa and *R. Acetosella.*—Usually called "Sourags."

Orchis maculata, L.—"Dogs' doddles."

Iris pseudacorus, L.—Common name "Sags."

Cynosurus cristatus, L.—"Kemps." The stems of this used to be plaited into small ropes (simmons), and used for tying up or binding straw baskets called "keyses."

Lycopodium Selago, L.—Used to be called "Limmerach."

CROYDON, *December* 1904.

[NOTE.—With reference to the above "Contribution," a few remarks may be not out of place.

Scabiosa arvensis, L.—This plant is common in South Kincardineshire; but in Aberdeenshire I have rarely seen it, and only under conditions that suggest its being rather a casual than even a denizen. I found one large example in 1888 in a pasture field in Orkney, in the parish of Sandwick.

Some of the local names suggest a relationship with local names given by Dr. Schubeler in the "Viridarium norvegicum," but, rather strangely, most of the latter are names given in districts of Germany. Such are *Poppelken* and *Puppen* for the white water-lily; *Jarrn*, *Jarre*, *Tjark* for *Spergula arvensis* (with which the popular name in Scotland, *Yarr*, is evidently related); *Mälkraut* for *Spiræa Ulmaria*; *Sigge* and *Ssigge* for *Iris pseudacorus*. In Orkney the usual name for *Iris* was, and I suppose still is, pronounced *Saeg*. The following popular names seem to point to Scandinavian sources rather than to German:—*Chrysanthemum segetum* has the names *Gulört*, *Gullkrage* and *Gulleblomma* given to it in Sweden, and *Gul Oxöie* in Denmark, clearly from the same origin as the names *Guile* (used in some parts of Scotland), *Gull*, *Golland*, *Gowlan*, *Golding*, and other variants in our islands, and *Golans* of Caithness.

Lummar or *Lummer*, Swedish names for *Lycopodium clavatum*, and *Lommer*, the Norse name for *L. Selago*, suggest the source of *Limmerach* for the latter plant in Caithness. — JAMES W. H. TRAIL.]

NOTES ON THE NEW EDITION OF BABINGTON'S "MANUAL OF BRITISH BOTANY."

By G. Claridge Druce, M.A., F.L.S.

The publication of this long-expected edition of Babington's well-known "Manual" must be of great interest to every British botanist; and we shall only be expressing the consensus of opinion when we offer to the editors a hearty congratulation upon the manner in which they have negotiated a delicate and difficult task. Doubtless if the editors had been completely untrammelled an even more interesting work might have been the result. But as it is we have had carefully preserved the great merits which characterised the Manual, and certain particulars which, despite the advances made in the knowledge of systematic botany, one would have been sorry to lose, especially the excellent description of so many species and varieties. The editors have followed on the same lines in their descriptions of the various additions which have been made since the publication of the last edition in 1881. These additions are printed in smaller type than the text of the last edition, so that they are readily recognised. About fifty new species are enumerated, but a considerable proportion are introduced species. They include *Ranunculus scoticus*, *Arabis alpina*, *Cochlearia alpina* (previously known as a variety), *C. grœnlandica*, *Sagina Boydii*, *Lupinus* (now identified as *L. Nootkatensis*, Sims), *Trifolium agrarium*, *Juncus tenuis*, *Scirpus ferrugineus*, *Carex chordorrhiza*, *C. salina*, *Calamagrostis strigosa* (if indeed that be correctly identified), *Poa palustris*, *Triticum alpinum* (now given specific rank), and *Nitella confervacea*. In addition, a large number of new varieties are given.

Many changes have been made in the nomenclature. It is pleasing to find that so many of those suggested by the writer in these pages nearly ten years ago, and which met with a somewhat violent opposition at the time, have now been adopted. We find, for instance, *Peramium* replacing *Goodyera*, *Kentranthus* for *Centranthus*, *Apinella* for *Trinia*, etc. The latter genus, with a single species, is now given as *Apinella*

glauca, O. Kuntze, but an earlier authority for the name is *Caruel*, in Parlatore's "Fl. Ital.," vol. viii. (1889), 503. Messrs. Groves have also wisely retained, as was also suggested in these pages, the old Linnean names of *Viola canina*, *Epilobium alpinum*, *E. tetragonum*, *Valeriana officinalis*, *Carex canescens*, *C. leporina*, *Agrostis alba*, etc., as well as *Sporganium erectum*, *S. nataus*, etc.

At one time Hill's "British Herbal" was not considered by many botanists as being valid for the citation of genera, since it was a work which did not use the reformed nomenclature of Linnæus. Now the editors cite freely from it, and the genera *Mariana* (*Silybum*), *Pneumaria* (*Mertensia*), *Phyllitis* (*Scolopendium*), *Radicula* (*Nasturtium*), and *Cammarum* (*Eranthis*) are employed. But if this "British Herbal" of 1756 be a valid source for genera, other changes are rendered necessary, since it appeared before the seventh edition of Miller's "Gardener's Dictionary" of 1759, whence several of our genera date, or the eighth edition of 1768, where the binomial system is first consistently used by Miller. So that the genera *Limonium*, *Glaucium*, *Fœniculum*, *Meum*, *Valerianella*, *Petasites*, *Hypopitys* (Babington uses *Monotropa*), *Fagopyrum*, *Alnus*, *Castanea*, and *Polygonatum* should be cited of Hill rather than from Miller, Adanson, or other later writers. Instead of *Limnanthemum*, Gmel., *Nymphoides*, Hill, has precedence, and our Fringed Water-Lily becomes *N. orbiculata*, Gilib. The various species of *Epipactis* must be transferred to *Helleborine*, Hill, *l.c.* p. 477, as *H. latifolia* (All.) and var. *atroviridis* (W. R. Linton), *H. Media* (Fries), *H. violacea* (Boreau), *H. sessilifolia* (Peterm.), *H. atrorubens* (Schultz), *H. ovalis* (Bab.), and *H. palustris* (Schrank). The genus *Erythræa*, which is quoted as of Necker, must also be replaced by Hill's genus *Centaurium*, a name which has already been adopted in the "Flora of Nieder-Oesterreich," by G. Beck. Our plants are *Centaurium inapertum*, Rafn. (*E. ramosissima*, Pers.), and var. *tenuiflorum* (Link), *C. umbellatum*, Gilib. (*E. Centaurium*, Pers.), and var. *capitatum* (Koch), *C. latifolium* (Sm.), *C. linariæfolium*, Beck (*C. littoralis*, Fries), and *C. capitatum* (Willd.). There is also a hybrid of *C. umbellatum* with *C. linariæfolium*, i.e. *C. intermedium* (Wheldon).

The Forget-me-not is now called *M. Scorpioides*, Linn., by the editors, and it was the var. b of that aggregate species in "Sp. Pl." 1753. *Suaeda* is now replaced by *Lerchia* of Haller, but it is possible that Haller's "Comm. Hort. Gott" was pre-Linnean; but since Linnæus, in the second edition of "Sp. Pl.," quotes Haller's *Lerchea* as a synonym, it may date from that work, and therefore previous to the publication of Adanson's genus *Dondia*, which the writer suggested.

In the "Manual" the genus is written *Lerchia*, not *Lerchea*.

The genus *Euphrasia*, now containing, so far as Britain is concerned, 13 species, 2 varieties, and 7 hybrids, is succinctly described, but the Scottish forms of Rhinanthus, *R. monticola*, *R. borealis*, and *R. rusticulus*, are not referred to. The Hawkweeds occupy 36 pages, and have been described by Miss R. F. Thompson, under the direction of Mr. F. J. Hanbury, an appalling number of 97 species being enumerated and a large number of varieties. The latter, however, do not agree with those given in the "London Catalogue," since the well-marked and widely-distributed var. *pellucidum* of *murorum* (*silvaticum*) is unnoticed, and *H. cumbriense*, which the writer re-found last year in Westmoreland, is also omitted, although it occupies the number 914 of the "London Catalogue." *H. sciaphilum* is separated by seven species from *H. vulgatum*, surely an unnatural severence, since most continental authorities treat it as a variety of *H. vulgatum*.

The Brambles as described by Prof. Babington are given, but an Appendix reprinted from the "Handbook of British Rubi," by the Rev. W. Moyle Rogers, is also thoughtfully included. Happy is that botanist who can run down a Hawkweed or a Bramble from description, even as carefully drawn up as those included in the "Manual." Among the points most interesting to Scottish botanists may be quoted that the Rescobie Water Buttercup is now considered to be a wholly submerged form of *R. drouetii*. *R. scoticus* is given specific rank, but the editors pertinently suggest that it may be a variety of *R. flammula*. *Caltha radicans* is only given for Rescobie; but if that plant is correctly named, it occurs in several Scottish localities, and the writer has also found it in Wales at Llanberis. The new species and arrangement

of the genus Fumaria by Mr. Pugsley is unnoticed ; possibly the sheets of the work were struck off prior to the appearance of his papers. Nor is the Grassington *Polygala* noticed ; and the colour of the Teesdale plant is given as blue, but pink-flowered forms also occur. No reference is made to the pretty variety of *P. oxyptera* var. *collina*, which occurs on the sandhills of Tain and Golspie.

The treatment of *Crataegus* is rather archaic, and the introduction of [*C. kyrtosstyla*] in brackets, without a description, does not assist to clear the air. The latter is a variety of *C. oxyacantha* (*L. monogyna*) with a deflexed style. There is no reference to *Epilobium collinum*. *Haloscias* of Fries is used as generic name for the Scottish Lovage, and *Mulgedium* is still retained, although the best botanical authorities agree in uniting it with *Lactuca*. Here, doubtless, the editors, had they possessed a free hand, would have followed ordinary custom. *Gentiana baltica* and *G. uliginosa* are said to be annual forms of *G. Amarella* and *G. campestris* respectively. No notice is made of the hybrid *G. Pamplinii* of *germanica* and *Amarella*, although it is included in Wettstein's "Monograph." The name *Orobanche rubra* is used, although *O. alba* has priority, and good authorities state they are synonymous. *Sisyrinchium californicum* is marked as possibly introduced, but now appearing like a true native. Surely there can be no doubt that a plant which is a native of Western America is an Alien in its single locality in Wexford, and the authors of the "Cybele Hibernica" refuse to give it a place in the list of native plants in Ireland.

It would probably be safer also to distinguish as an Alien *Naias graminea*. No notice is taken of the Lawers locality for *Carex helvola*, and the name *C. elata*, All., is rightly adopted for the *C. stricta* of British authors. *C. Sadleri* is given distinct rank, and is separated by seven species from *C. binervis*, which is its nearest ally, if indeed it be distinct. The synonym *C. rhynchophysa*, Praeger and Bennett, might have been given to the var. *latifolia*, Asch, of *C. rostrata* ; the same variety occurs in Islay. *Agrostis nigra* is kept distinct, and is put between *A. canina* and *A. vulgaris*, but it would better have been inserted between *A. vulgaris* and *A. alba*. Nor can the writer agree with

Bromus interruptus being treated as a variety of *Aerrafalcus mollis*, nor in the citation of a name which Mr. Daydon Jackson, Professor Hackel, and Dr. Otto Kuntze consider to be invalid. The sands of Barry and the Ayrshire *Botrychiums* are not included in the general text, the editors naturally thinking that the records need confirmation.

The reader will see from these scattered notes what an interesting treat is afforded by the industry of the editors, who have placed British botanists again under a sense of deep obligation for their great and valuable addition to British botany.

OXFORD, *November* 1904.

ZOOLOGICAL NOTES.

Scottish Lists of Vermin.—In the "Annals" for July last (p. 185) Mr. Harvie-Brown gives a list of vermin killed on the Glengarry estates, Inverness-shire, between 1837 and 1840, with the remark, "I think this list has not appeared before." As a matter of fact it was published in 1850 in Knox's "Game-Birds and Wild-Fowl," p. 117. Not only so, but Knox's list is fuller, and contains the following species not mentioned in the "Annals": Ospreys, 18; Common Buzzards, 285; Bluehawks or Peregrine Falcons, 98; Orange-legged Falcons, 7; Hobbyhawks, 11. The following variations also occur: Merlins, 78, instead of 79; Hen Harriers, 83, instead of 63. The fact that Peregrines (98) are specifically mentioned disposes of the suggestion in the "Annals" that Goshawks (63) must be read Peregrines. By an apparent oversight the Golden Owls (3), probably Barn Owls, as suggested by Knox, have been omitted from the list given in the "Annals," though mentioned in the comments thereon. It may be recollected that in the "Annals" for 1875 (p. 193) Mr. Maclaine of Lochbuie communicated a list of vermin killed on the estates of Torosay and Lochbuie, in the Island of Mull, in 1825. I can now give a much older list of vermin killed in Aberdeenshire (1776-1786), which I copied some years ago into one of my note-books from the "London Chronicle" of 18th September 1812. It runs as follows:—

"Previous to the year 1776 the destruction of sheep by ravenous animals was so great in the wilds of Aberdeenshire as to be computed to be equal in value to half the whole rents; and the

game and poultry suffered in full proportion. At this time a subscription was entered into, and applied to premiums for removing the evil. This continued for ten years, when it was found that during that time, in five parishes only, 634 Foxes, 44 Wild Cats, 57 Polecats, 70 Eagles, 2520 Hawks and Kites, and 1347 Ravens were killed, besides many which died by poison, or of their wounds, and sheep have since been in perfect safety at all seasons in those parts."

In Sir Herbert Maxwell's "Memoirs of the Months," first series, 1897, p. 76, a list is given of vermin destroyed by the keeper on Lord Malmesbury's estate, Heron Court, near Christchurch, in the year 1852; but as this does not relate to Scotland I omit the details here, merely observing that the total for the year amounted to 1327 head, and was made up chiefly of Squirrels (220), Jackdaws (210), Hedgehogs (250), and Rats (300), the number of Hawks, Jays, Magpies, and Stoats amounting to less than 100 each. It is sad to find that Woodpeckers to the number of 50 are included in this list, but, as remarked by Sir Herbert Maxwell in commenting on this fact, there is ground for belief that the character of the Yaffle has since been cleared of all suspicion.—J. E. Harting.

[See "The Vertebrate Fauna of Scotland," vol. ix. p. 165, where Knox's correct List is referred to under *Kite*. See also in the same series, in vol. ii. of "A Vertebrate Fauna of the Moray Basin," p. 60. We cannot quote directly Knox's list as authority for "Orange-legged Hobby."—J. A. H. B.]

On the First Occurrence of the Noctule in Scotland.—So far the Noctule Bat (*Pipistrellus noctula*) is not known to have occurred in Scotland. The late Mr. E. A. Alston ("Fauna of Scotland," 1880, p. 7) did not credit Sir William Jardine's statement, in the "New Stat. Account, Dumfries" (p. 175), that it had been seen on the Annan in Dumfriesshire. After many years spent in working at our northern fauna I have never heard of a single instance of the existence of any large species of bat until 15th October of this year, when Mr. Charles Eversfield of Deane, whose father had rented the Dalguise shootings and fishings on the Tay in Perthshire, sent me in the flesh a large female Noctule ($14\frac{1}{2}$ inches across the wings) which he had killed two days previously at that place. Mr. Eversfield has a fair knowledge of our bats, having assisted me to procure specimens on several occasions, and the unusual size of the present example attracted his notice whilst salmon-fishing, so he procured his gun and shot it as it hawked up and down over the river. Unfortunately the specimen was somewhat decomposed by the time it reached me, but I am preserving the skeleton for the Perth Museum.—J. G. Millais, Horsham.

Bank Vole and Water Shrew in Argyllshire.—I have to record the occurrence of the Bank Vole (*Evotomys glareolus*) in the

Loch Awe district, where in the past autumn I have taken several specimens, which I have forwarded to Mr. Harvie-Brown and Mr. Eagle Clarke. This little rodent is new to the fauna of Argyll, though it is known to occur in West Ross-shire. I have also trapped several examples of the Water Shrew (*Crossopus fodiens*) in a run close to a drain running through a shrubbery to a small Highland burn. Though not new to the fauna of Argyll, this interesting species has, I believe, only hitherto been recorded from Morven and the Island of Kerrera, in the southern portion of the area.—Charles H. Alston, Letterawe.

Pied Flycatchers and Ivory Gull in Fife.—The birds most worthy of note that we have seen this year are—Two Pied Flycatchers (*Muscicapa atricapilla*) in May. One arrived on the 8th at Gilston, the other on the 12th at Largo; both left on the 14th, when the wind turned to the west, after blowing several days strongly from the east. One was an old male in beautiful plumage, the other also a male, but not in such fine feather. Both were remarkably tame when they arrived, but got wilder every day. The other occurrence was an Ivory Gull (*Pagophila eburnea*) we saw in Largo Bay on the 14th September about 5 P.M. It flew past close beneath us as we were sitting on a sand-dune, and we had an excellent view of its pure white plumage, black eye, and yellow bill. —Leonora Jeffrey Rintoul, Evelyn V. Baxter, Lahill, Largo.

Kingfisher in Fife.—A specimen of the Kingfisher (*Alcedo ispida*) was shot on 29th October last in a garden at Tayport. The young man who shot it was fined 2s. 6d. by the Sheriff at Cupar, and the bird was forfeited and ordered to be delivered to St. Andrews University Museum. It is much to be regretted that the bird was killed.—Henry H. Brown, Cupar-Fife.

Naturalisation of the Golden Pheasant.—I grew up in the belief that the Golden Pheasant (*Thaumalea picta*) required the protection of an aviary in the climate of Scotland; but about ten years ago the Duke of Bedford turned some out in the woods of Cairnsmore, near Newton-Stewart, where they have become perfectly acclimatised and have bred freely. From Cairnsmore they have spread to neighbouring properties, where their presence is not properly appreciated, partly because of the mistaken idea that they are pugnacious, and drive the Common Pheasant from their haunts, and partly because they cannot be considered a sporting bird. Three years ago, hearing that a friend was destroying these beautiful birds on his property, I put in a petition for a few. I turned down two cocks and four or five hens, which have bred each season since, and form a most desirable addition to the ornis of our district. Unluckily, as I think (for I detest hybrids), the Golden Pheasant has an incorrigible tendency to intermarry with the Amherst (*Thaumalea*

amherstiæ). The offspring are very gay birds, and are fertile, proving the near affinity of the two species; but I prefer the pure race. I have said that it is a mistake to suppose that the Golden Pheasant is quarrelsome. My gamekeeper says he has never seen them fighting with the Common Pheasant; but the same cannot be said of the Silver Pheasant (*Euplocomus nycthemerus*), which is an undesirable denizen of pheasant preserves. It takes as naturally to British woodlands as the other; it used to be pretty to see them flying from side to side of the wooded banks of Ayr in the park at Auchencruive. One drawback there is to the Golden Pheasant: the male seems to be conscious of being over-dressed, and, except in the breeding-season, when he suns himself with his harem, keeps sedulously in the thickets, shunning the presence of man far more suspiciously than the true pheasant, though with far less reason.—HERBERT MAXWELL, Monreith, Wigtownshire.

Shoveller, Grey Plover, Greenshank, and Great Northern Diver in Bute.—Mr. Robert Wilson kindly informed me that, on 8th May 1904, he saw a male Shoveller (*Spatula clypeata*) on Greenan Loch; and a Great Northern Diver (*Colymbus glacialis*) in full breeding plumage, at Scalpsie Bay. On 6th October I observed a Grey Plover (*Squatarola helvetica*) at St. Ninian's Bay, and again on 10th October I saw, probably, the same bird—among Golden Plovers in each instance. On 10th October I saw a Greenshank (*Totanus canescens*) at Kilchattan Bay. The Shoveller, Grey Plover, and Greenshank are additions to "A List of the Birds of the Island of Bute" published in the "Annals" for July 1903, while the date of the occurrence of the Great Northern Diver is of some interest.—JOHN ROBERTSON, Thornliebank.

Shoveller in the Firth of Forth.—On 19th November, in a walk along the south side of the Forth, my friend Mr. Henry D. Simpson and I saw a Shoveller drake (*Spatula clypeata*) in company with a dozen Mallard (*Anas boscas*) to the west of Morrison's Haven. By this date no frost had arrived to drive the bird from inland waters.—R. B. WHYTE, Edinburgh.

Eiders in the North-West Highlands.—With regard to the notes on the above subject in the July "Annals," it may be interesting to mention that I saw at least six pairs of Eider Ducks (*Somateria mollissima*) at the Summer Islands during the summer that is just past. This is the first time I have seen Eiders in Lochbroom. I am strongly of opinion that a pair, at least, have nested in one of the islands called Little Tannara. Next year I will pay more attention to Eiders if they should again visit Lochbroom.—J. T. HENDERSON, Ullapool.

Great Snipe in Shetland.—A Great Snipe (*Scolopax major*) was shot on Tuesday, 20th September, in Unst, by Mr. Edmonston

of Buness. These birds are very rare in Shetland. It was a young bird, and weighed $7\frac{1}{2}$ oz.—"Shetland Times," 1st October 1904.

[If this bird has been correctly identified, it is the second authentic record for Shetland. The weight, however, must not be regarded as conclusive evidence, especially in this case, for we have received Common Snipe from Shetland weighing $7\frac{3}{4}$ oz.—EDS.]

Little Auk in Forfarshire.—A Little Auk (*Mergulus alle*) was brought to me on 16th November, the first which I have seen for some years. It had been taken in a turnip-field on Seaton, within a mile of the coast. As it seemed uninjured and fairly vigorous I took it to the shore and watched it paddle off over the moonlit waters with hopeful alacrity.—THOMAS F. DEWAR, Arbroath.

Breeding of the Storm Petrel on the Bass Rock.—When at the Flannan Islands in September last, I was surprised to learn from Mr. Ross, one of the lightkeepers, that the Storm Petrel (*Procellaria pelagica*) had bred on the Bass Rock during the past summer. I was naturally much interested, and on my return to Edinburgh I wrote Mr. Laidlaw, the principal lightkeeper at the Bass Rock, for full particulars on the subject. Mr. Laidlaw most kindly called upon me and related all the facts connected with the discovery. These are shortly as follows:—On the 19th of June, one of the keepers found a Petrel and its egg in a shallow burrow on a bank near the old buildings. The bird was captured, and Mr. Laidlaw had it in his hands, and examined it, ere it was set at liberty, and he assured me that it was not a common Storm Petrel, a bird with which he, both as a seaman and a lightkeeper, was perfectly familiar, but a "Forked-tailed Storm Petrel" (*Oceanodroma leucorrhoa*). On this point he was quite emphatic, and accurately described the differences between the two species. The egg, he informed me, was taken, and was then in the possession of a collector at Portobello, near Edinburgh. I expressed a strong desire to see the egg in order to set the matter of identification beyond doubt, and Mr. Laidlaw promised to do his utmost to this end, and that he failed in his endeavours was, I am sure, due to no fault on his part.

But history was soon to be made of the information, for the Rev. H. N. Bonar recorded in "The Field" for 19th November, (p. 908) the breeding of the Fork-tailed Petrel on the Bass Rock, based, presumably on similar evidence to that given to me, as related above. Soon after, however, Mr. Bonar succeeded where I had failed, for he obtained a sight of the egg, which, from its dimensions, he tells us is a Storm Petrel's after all (see "The Field," 3rd December 1904, p. 983), so that, in spite of conflicting evidence, it is to be hoped the identification may now be considered as satisfactorily established. That either of these species should have been detected nesting on or off the East Coast

of the mainland of Great Britain is an extremely interesting fact; and it is much to be hoped, though, perhaps, too much to be expected, that the interesting little bird will be allowed to establish itself in its newly sought eastern home.—Wm. Eagle Clarke.

The Porbeagle (*Lamna cornubica*) in the Firth of Forth.—On 1st November 1904 an example of this Shark, which I examined two days later, was caught in a cod-net about 3 miles north-east of Fisherrow, and brought into that harbour. It was fully 7 feet long. I looked to see if there was any trace of a spiracle behind the eye, and could find none. In a newspaper paragraph the creature was referred to as a Blue Shark, which serves to illustrate the vague way in which our fishermen apply that name.—William Evans, Edinburgh.

Capture of a marked Skate.—A small Skate (*Raia batis*) was caught at the end of September by one of the local fishermen at Tobermory. It was observed to be strangely marked on both shoulders nearly opposite the part where the pectoral fins are most extended. The markings are in the form of two circles, about the size of a crown-piece, one of which has the figure 2 and the letter n quite distinctly defined. There are a number of dots inside the circle. The other circle (on the left shoulder) contains two characters resembling the Greek letter x (ξ), also surrounded with a row of dots. The markings are all white against the dark background of the skin of the Skate, and there are several indications that the marks were made with great precision, and at a time when the fish was much less than it is now. I think it is worth while to draw attention to this capture, as the fish may have been marked for experimental purposes.—J. Macnaught Campbell, The Museum, Glasgow.

Cionus tuberculosus, *Scop.*, in Argyllshire.—In the month of August my friend Mr. J. W. Bowhill obtained several specimens of this pretty beetle on the shores of Loch Fochan, near Oban. In Fowler's "British Coleoptera" the only Scottish record is that quoted from Murray's Catalogue, thus: "Dollar, Mr. J. T. Syme;" to which Fowler adds: "Scotland, very rare, Forth district," and remarks that "it is possible there may be some mistake as to the latter record." Under these circumstances it is well to place on record the undoubted occurrence of the species in Scotland. Prof. T. Hudson Beare has seen the specimens, two of which have been very kindly presented by Mr. Bowhill to the Royal Scottish Museum. —Percy H. Grimshaw.

Alleged Buried Crabs.—The following note appeared in the "Haddingtonshire Courier" of the 29th November last:—

"A Strange Find.—While engaged in the work of excavation towards the end of the week, in the plasterers' yard [at Dunbar] of Councillor Gillies, the workmen, at a depth of about ten feet, came upon a bank of sand, embedded in which were two good-sized black-

backed crabs, alive, and in perfect condition. The yard is a long distance from the beach—there are two streets between it and the sea—so that the shell-fish in question must have existed in these quarters for a long number of years. Prior to the construction of these streets the sea washed up as far as the yard belonging to Mr. Gillies. The crabs have been preserved."

The specimens sent to me by the courtesy of Mr. Philip and Mr. Bertram, associated as sub-editor and reporter respectively for the "People's Journal" (Dundee), were quite ordinary forms of the Common Shore-Crab (*Carcinus mænas*). The dark colour of one of the specimens is quite common on the beach. As Mr. Bertram avouches that the "find" was quite genuine, I would suggest (*a*) that some schoolboy or fisherman threw the crabs into the vicinity of the excavation, which, probably, was not made in a day; or (*b*) that there may be some more or less open conduit, sewer, or drain in the immediate vicinity of the excavation in Councillor Gillies's yard, from which the misguided crabs may have found their way into the sand. It is well known that these shore-crabs travel far, burrow deeply, and burrow rapidly. While we know of cases of "animal hypnosis" in the higher crustaceans, we have not the slightest warrant for believing that (gill-breathing) crabs could remain "for a hundred years or more" imbedded in sand "separated by two streets from the sea." Both the crabs were relatively young, and neither showed any external signs of age or desiccation. On the whole, we suspect a practical joker.—J. Arthur Thomson, Aberdeen.

Orthezia cataphracta, *Shaw*, in the "Forth" Area.—This curious insect—one of the Coccids—is common in this district, especially on the hills, where it usually occurs among moss or under moss-embedded stones. There is no need to particularise localities, but I may say that I have found it on the Pentlands and other hills in all three Lothians; also on the Lomonds, the Ochils, and the Callander Hills. Specimens from the tops of Carnethy (March 1894 and October 1904) and Scaldlaw (March 1903)—both in the Pentland range—have been verified as to identification by Mr. R. Newstead, Chester. Under the name of *Orthezia signoreti* this insect was described by the late Dr. Buchanan White from Glen Tilt ("Scot. Nat." iv. p. 161), and Mr. Newstead, in his recent monograph of the Coccidæ, mentions its occurrence in Ayrshire, and in the Hebrides, including St. Kilda.—William Evans, Edinburgh.

Rhynchodemus terrestris, a Land Planarian, in the Edinburgh District.—When looking for beetles and slugs under stones, pieces of wood, etc., lying in damp places, I have frequently noticed a small slate-coloured Planarian worm which I recently made out to be *Rhynchodemus terrestris* (Müll). Two specimens from the under-

side of a piece of wood lying on damp earth at Morningside, Edinburgh, 2nd November 1904, have been submitted to Dr. R. F. Scharff, Dublin, who has written on the Irish species of the group, and he confirms my identification. Other localities in which I have noted this planarian are near Roslin, near Aberdour, and near Balerno, where it occurred in flood refuse in April 1903. It is no doubt widely distributed and not scarce in Scotland, but the only previous Scottish record I have seen is that of Dr. W. T. Calman from Kirkmichael in Perthshire ("Ann. Scot. Nat. Hist." 1902, p. 232).—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

Anthoxanthum Puelii, *Lec.* and *Lam.*—*var. β nana*, Townsend, ("Journ. Botany," 1875, p. 4), *A. odoratum*, *β nanum*, Lloyd (*Fl. Loire Infer.*, p. 293).—In the "Journal of Botany," *l.c.* Mr. F. Townsend calls attention to specimens he possesses of the above grass from Mr. W. Gardiner, labelled "*A. odoratum*, L., alp. st., Loc. Ben Avon ; Hab. Summit ; Co. Aberdeen ; Coll. July, 1844." Mr. Townsend remarks : "Ben Avon is over 4900 feet above sea level." Of course this was a slip, as the height of Ben Avon is 3843 feet only. Mr. Townsend gives several other names under which it has appeared. Dr. Trail, in 'Topographical Botany of Scotland,' "Ann. Scot. Nat. Hist." 1900, p. 37, notices it under the name "92, var. *nana*."

Gray ("Nat. Arr. Brit. Plants," p. 135, 1821) has, under *A. odoratum*, a variety "*β alpinum*, spike branched ; awn longer than the flowrets, leaves smooth. Perhaps a distinct species." This seems to apply to this alpine form of *A. Puelii* ; but I have not been able to find it noticed in British books. Smith ("Eng. Flora," i. p. 37, 1828) takes no note of it. This form is put under *A. aristatum*, Boiss., as *A. Lloydii*, Jord., by Nyman ("Consp. Fl. Europ," p. 790 (iv.) 1882) ; but Mr. Townsend considered (*l.c.*) that it came under *Puelii*. I send this note to ask : "Has anyone gathered this plant since Gardiner's time?"

Unfortunately Gray gives no station, and I have not been able to trace any specimens, or any notice of it since Mr. Townsend's article on *A. Puelii*.—ARTHUR BENNETT.

Fungus Flora of a Cast-out Hearthrug.—Under this heading Messrs. C. Crossland and J. Needham in "The Naturalist" (1904, pp. 359-363) give an account of the various species found growing on a worn-out rug, between February 1897 and the spring of 1899, in a wood near Hebden Bridge. The rug was made of pieces of cloth fixed into a coarse sacking, and backed with jute sheeting, its fibres including wool, cotton and jute. The species observed

extended to four *Hymenomycetes*, eleven *Ascomycetes*, and two imperfect forms, of which one proved new to science. Of these, two of the *Hymenomycetes* are usually found on the soil, and may have grown up through the rug. The various species are named, and the order in which they showed themselves is stated.

Good King Henry.—In "The Naturalist" (1904, pp. 369-375) is an interesting paper by Mr. Walter Johnson, of which this plant (*Chenopodium Bonus-Henricus*, L.) is the subject. The name is discussed, and the author is disposed to regard it as from the German *Guter Heinrich*, or the Dutch *Goeden Hendrik*, which Grimm regards as derived from association with *Heinrich* as a frequent name for elves or kobolds. In Lincolnshire it is called Marquery or Markery. In Lincolnshire and other English counties it is used frequently like spinach. Mr. Johnson thinks it must be looked on as introduced by man into England. It has still less claim to be accepted as native in Scotland.

On a New Sub-var. of Poa annua, *L.*, in Wigtown.—In 1881 I found on the sandy shore of Stranraer Bay a perennial form of *Poa annua* which was so different from the type as to be named *Schlerochloa maritima* by the critical botanist. It remained among some queries in my herbarium till I recently saw it belonged to the above species. Prof. Hackel recently reports it as a new and interesting form for which he proposes the name *P. annua*, L., var. *supina*, Reichb. sub-var. *condensata*, Hack., differing from the ordinary variety by the branches bearing spikelets from a little above the base.—G. C. Druce.

Hypocrea riccioides in New Galloway.—At a meeting of the Edinburgh Microscopical and Field Naturalists' Society on 21st December last Mr. James M'Andrew exhibited specimens of a rare fungus, *Hypocrea riccioides*. He found it first in 1878 near New Galloway on dead stems of the willow, and afterwards in four different localities within a diameter of eight miles round New Galloway. Mr. M'Andrew was the first to find it in Scotland, and the only person who has as yet found it on this side of the Border. It was found in England in 1790, and as D. M. C. Cooke, in his "Handbook of British Fungi," gives Halifax as the locality, this may be the place where it was found in 1790, but no date is given. The plant is figured and described by Bolton. It was found by Tode, who figures it under the name of *Acrosperma achenoides* in his "Fungi of Mecklingburg." L'Amy found it near Limoges, and his specimen is figured by Dr. Montague in "Annales des Sciences Naturelles" for 1836, who did not, however, identify it with the plant of Bolton. These are probably the only occasions on which this rare and interesting species has been found. A short account of it appears in the "Scottish Naturalist" of July 1878, p. 304.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1904.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Wild Cat in Inverness-shire. T. F. Donald. *The Field*, 1st October 1904, p. 614.—Two specimens recently captured in the west of the county.

White-Beaked Dolphin (Lagenorhynchus albirostris), off Aberdeen. Geo. Sim. *Zoologist*, October 1904, p. 383.—A specimen, 4 feet long, caught 16 miles off Buchanness, 23rd July 1904, and another on 18th August, caught by trawl 30-40 miles off Aberdeen.

Quail in Mull. Robert Chambers. *The Field*, 12th November 1904, p. 864.—One shot on West Ardow on 29th October.

Grey Phalarope at Aberdeen. Geo. Sim. *Zoologist*, October 1904, p. 389.—Specimen caught in Aberdeen Harbour, 8th December 1903.

Great Snipe in Caithness. H. W. B. Scholfield. *The Field*, 8th October 1904, p. 654.—One killed on 28th September, in the Stirkoke shooting.

Great Snipe in Dumfriesshire. C. Hinton. *The Field*, 8th October 1904, p. 654.—One shot on 28th September.

List of British Dolichopodidæ, with Tables and Notes. By G. H. Verrall, F.E.S. *Ent. Mo. Mag.* October 1904, pp. 223-228; November 1904, pp. 241-245.—In this useful paper many references are given to Scottish localities.

Callicera Yerburyi, n.sp.: A British Syrphid new to Science. By G. H. Verrall, F.E.S. *Ent. Mo. Mag.* October 1904, p. 229.—A short description of a beautiful new fly, of which four females were captured by Col. Yerbury at Nethy Bridge this year.

Aculeate Hymenoptera from Fort William, N.B., and Neighbourhood. G. A. James Rothney. *Ent. Mo. Mag.* December 1904, p. 280.—Seventeen species recorded.

Hynenoptera aculeata captured by Col. Yerbury, R.A., in Scotland, 1904. By Edward Saunders, F.R.S., etc. *Ent. Mo. Mag.* November 1904, pp. 248-249.—Thirty-six species are here recorded.

Coleoptera in Scotland. Theodore Wood. *Ent. Mo. Mag.* November 1904, pp. 260-261.—Notes on specimens taken during June and July at Kenmore (Loch Tay), Rannoch, and Boat of Garten.

Lochmæa suturalis, Thoms., var. nigrita, Weise. Wm. Evans. *Ent. Mo. Mag.* October 1904, p. 238.—Two specimens of this variety taken near Kirknewton on 3rd May 1901.

Neuromia clathrata, Kol., in Wigtownshire. Kenneth J. Morton. *Ent. Mo. Mag.* December 1904, p. 281.—A female taken by Mr. J. G. Gordon at Corsemalzie in June of last year. This is an extremely rare species, and the present is the first Scottish record.

BOTANY.

Biographical Index of British and Irish Botanists. By James Britten, K.S.G., F.L.S., and G. S. Boulger, F.G.S., F.L.S. Second Supplement, 1898-1902 (from Milne to Young), *Journ. Bot.*, 1904, pp. 378-385.—In this useful Index are included the following names of Scottish Botanists:—Rev. John Hutton Pollexfen (1813-1899); John Rattray, B.Sc. (1858-1900); Edward J. Ravenscroft (1816-1890); John Sim (1824-1901); Robert Smith, B.Sc. (1873-1900); Col. John S. Stirling (-1900); John Storrie (1843-1901); Dr. Charles Stuart (1825-1902); Dr. Peter C. Sutherland, (1822-1900).

Proceedings of the Perthshire Society of Natural Science, Winter Session 1903-4, includes (pages vii-xiv) a brief account of plants, etc., found in excursions of the Society in 1903, —On June 1, to Kirkmichael; June 20, to North Queensferry and Rosyth; July 25, Invergowrie to Longforgan; Aug. 5, to Wormit; and of the Meeting of the Scottish Cryptogamic Society, Sept. 29, 30, Oct. 1, at Perth, with visits to Kinnoull Hill and Scone Woods.

The Riverside Marshes between Errol and Invergowrie. By William Barclay. *Trans. Perthsh. Soc. N.S.*, 1894, iv. 1, pp. 58-62.—An account of the characteristic vegetation of the Tay in its lower course.

Suggestions towards the Preparation of a Record of the Flora of Scotland. By James W. H. Trail, M.D., F.R.S. *Trans. Bot. Soc. Edinb.*, xxii. part iii. pp. 265-277, 1904 (read 12/2/03).

Topographical Botany of the River-Basins Forth and Tweed in Scotland. By James W. H. Trail, M.D., F.R.S. *Trans. B. S. Ed.*, xxii. part iii. pp. 277-308, 1904 (read 12/2/03). —An abstract of the records of distribution, so far as known to the author up to end of 1902, of plants, natives and aliens, through the counties included in these river-basins.

Notes on Limonium, II. L. Neumani (= L. humile × vulgare). By C. E. Salmon. *Journ. Bot.*, 1904, pp. 361-363.—This article discusses the distribution in Britain of the hybrid (first detected as British in Aug. 1901, in West Sussex), and notes it from 73, Kirkcudbright and, ? 74, Wigtown, as shown by specimens in Edinburgh herbarium.

Veronica Buxbaumii as a British Colonist. By Frederic N. Williams, F.L.S. *Journ. Bot.*, 1904, pp. 253-254.—Points out that the British plant must bear the above name, and is distinct from *V. filiformis*, Smith (= *V. Tournefortii*, Gmel., = *V. persica*, Poir.), and that it was first found in Britain, in Berkshire, in 1825, but first recorded as British in Johnston's *Flora of Berwick-upon-Tweed*, in 1829.

Cowthorpe Oak. By John Clayton. *Trans. B. S. Ed.*, xxii. part iii. pp. 396-414, plates 1-7, 1904 (read 12/3/03).—Discusses the dimensions of the largest trees (Oak, Chestnuts, and Yew) in England, and their probable ages, and concludes that age is usually much over-estimated.

Carex divisa, Hudson, as a Scottish Plant. By Alex. Somerville, B.Sc., F.L.S. *Trans. B. S. Ed.*, xxii. part iii. pp. 309-311, 1904 (read 12/3/03).

On the Genus Polystichum, Roth. (Aspidium, Swartz, in part), with Special Reference to P. angulare, Presl., and to its Distribution in Scotland. By Alex. Somerville, B.Sc., F.L.S. *Trans. B. S. Edin.* xxii. part iii. pp. 312-317, 1902.

Revised Note on Laminaria. By Thomas Berwick. *Trans. B. S. Ed.* xxii. part iii. pp. 395-396, 1904 (read 9/7/03).—States methods of demonstrating presence of chlorophyll in the genus.

Notes on the Drawings for "English Botany." By F. N. A. Garry, M.A. Issued as a *Supplement* to *Journ. Bot.*, pp. 241-247, from *Spartina stricta*, Roth., concluded with *Chara fragifera*, Durieu, and an index to the genera.

Report of the 1902 Excursion of the Scottish Alpine Club to Tyndrum. By Alexander Cowan, Esq. *Trans. B. S. Ed.*, xxii. part iii. pp. 317-318.

Notes on a Census of the Flora of the Australian Alps. By James Stirling, A.I.C.E. *Trans. B. S. Ed.*, xxii. part iii. pp. 319-395, 1904 (read 12/2/04).—Introductory remarks are followed by an enumeration of the species, with the elevations reached by them; and some of those which grow in Scotland are marked with an asterisk.

BOOK NOTICES.

A Fauna of the North-West Highlands and Skye. By J. A. Harvie-Brown and Rev. H. A. Macpherson. Edinburgh: David Douglas, 1904.

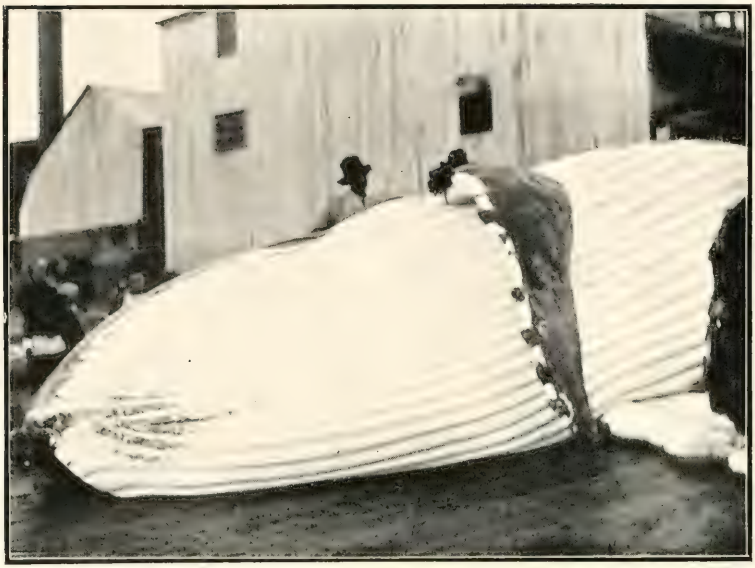
In connection with the appearance of this volume, Mr. Harvie-Brown is to be congratulated on several grounds. First, there is the fact that we have in it an important addition to the volumes of his great scheme for a complete series devoted to the Vertebrate Fauna of Scotland. Secondly, and we are sure this will give great satisfaction to British naturalists, the valuable manuscripts relating to Skye, the result of years of personal experience and patient labour on the part of the late Rev. H. A. Macpherson, now see the light, and this, too, in their original state. These are unedited, and thus retain all their original freshness, which is especially gratifying, since they include many field notes on the habits, etc., of the birds in which he was wont to delight. Another matter for satisfaction is the title bestowed upon the book. We are glad to see "North-West Highlands and Skye" substituted for the singularly inappropriate one of "West Ross," which has hitherto done duty for the faunal area which comprises the western portions of the counties of Sutherland and Ross-shire, the north-west portion of Inverness-shire, and the Isle of Skye.

The book, like the others of the series already published, gives much information relating to the various species of Vertebrates, and their distribution within the area. Special attention should be called to the very thorough manner in which Mr. Harvie-Brown has worked out the past history of that now, alas, banished Scottish bird, the Osprey, within the area which once knew it so well, and to which it was an ornament in the eyes of all interested in Natural History. This important and valuable contribution occupies twenty-eight pages, and is illustrated by five full-page plates and by ten minor pictures in the text.—W. E. C.

Notes on the Natural History of the Bell Rock. By J. M. Campbell, with an Introduction by James Murdoch. Edinburgh: David Doulgas, 1904.

"These desultory notes," we are told in the preface, "were

originally undertaken at the instigation of an invalid friend, desirous of a closer acquaintance with our lonely environments." As the production of an assistant lightkeeper the book is certainly a surprising one. It is not only charmingly written, but it clearly proves that the author is a careful, close, and enthusiastic observer of nature. It does not pretend to tell us anything that we do not know, nor is it always quite accurate, but it is full of varied and interesting information relating to marine creatures, from sea-anemones to whales, and on the visits of birds and their observance of the times of their comings and goings. Mr. Campbell, thanks to his predilections, had evidently not a dull time during his nine years' residence in that lonely tower in the North Sea, for at all seasons we find him engrossed in the creatures with which Dame Nature supplied him as subjects worthy of his attention. He wisely seized the almost unique opportunities afforded him, and he presents us with the results in this little book, which is without a dull page—one which we read from cover to cover with pleasure, and, may we say, not a little admiration for its author. We know that there are others in the same service who are excellent observers and writers, and we hope that they may be induced to follow Mr. Campbell's example and not "hide their lights under a bushel."



MEGAPTERA, WHITE BENEATH WITH DARK FLIPPERS.



MEGAPTERA, DARK BENEATH WITH WHITE FLIPPERS.

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NOTES ON WHALING IN SHETLAND, 1904.

By R. C. Haldane.

Plate III.

Living as I do less than a mile from one station, and an hour's walk from two more, I have unusually good opportunities of getting information about Whales. My thanks are due to Messrs. Föden, Castberg, and Mathisen for kindly keeping a register of whales killed. The results of the whaling for this year at these three stations, as far as I have the returns, are as follows :—

Norrona Co.	99 whales	(Finners 97, *Megaptera* 1, *B. borealis* 1).
Shetland Co.	64 ,,	(,, 63, ... ,, 1).
Alexandra Co.	72 ,,	(,, 66, *Megaptera* 4, ,, 1, and one Sperm Whale).

Of the Finners (*B. musculus*) I have the following particulars of the average length :—

Norrona	57 bulls	aver. 63.1 feet,	38 cows	aver. 66.3 feet.		
Shetland	36 ,,	59.0 ,,	27 ,,	64.7 ,,		
Alexandra	40 ,,	60.4 ,,	26 ,,	61.1 ,,		

Deducting all whales of under 56 feet as immature, we have the following average lengths :—

Norrona	55	bulls average	63.9	feet,	36	cows average	67.4 feet.
Shetland	33	,,	62.6	,,	25	,,	65.9 ,,
Alexandra	36	,,	62.4	,,	20	,,	64.8 ,,

To take the largest whales caught by each station—

Norrona—9 bulls of 70 feet and over, 5 largest 78, 77, 77, 75, 75 feet.
Norrona—14 cows ,, 5 ,, 78, 76, 75, 75, 73 ,,
Shetland—largest bull, 68 feet; 6 cows over 70 feet, 75, 71½, 70, 70, 70 feet.
Alexandra—largest bull, 68 feet; 3 cows over 70 feet—72, 71, 70 feet.

Possibly the measuring of the Norrona whales was not in quite a straight line, but the measurements of the Shetland and Alexandra stations are near enough to give a very fair idea of the sizes of the whales.

The Norwegians say the average length of an adult Finner whale is 65 feet, and this is probably nearly correct. By the table given above, the average length of 135 bulls was 62.9 feet, and the average length of 91 cows 66.0 feet, which sufficiently proves that cows generally grow to a length of 3 feet more than bulls do, although the Norrona station figures show that some bulls may attain to as great a length, which, the Norwegians say, is sometimes the case.

The girth of these whales varies greatly. A cow of 70 feet, measured by myself at the Alexandra station, was 33 feet round. At the Shetland station one of the same size was 25 feet. At the Norrona station a cow of 75 feet was 42 feet. Two cows of 76 and 75 feet were both 30 feet. A bull of 77 feet was 34 feet. A bull of 65 feet was 30 feet. Two cows of 73 and 72 feet were both 36 feet.

It is interesting to notice the greater number of bulls to cows. Out of 226 whales, 135 were bulls and 91 cows, or 60 per cent of bulls to 40 per cent of cows. Are there fewer cows than bulls, or are the cows more difficult to approach?

I have measurements of four *Megaptera boops*, 30, 39, 40, and 46 feet in length; the last, a bull, was 31 feet in girth, the flippers 13 feet 10 inches long. The colour of *Megaptera* differs greatly in various specimens. In some the thorax is white, also the flippers, which have a few black blotches. In others the grooves on the thorax are black and the raised parts white. In some the thorax and flippers are black and

white. I am unable, as yet, to offer any solution of these differences of colour, which may be due to age, or more probably natural. In three which I photographed the following variations are shown:—(1) Bull, 46 feet, black, some white on the bands between the grooves, upper side of flipper white; (2) bull, 30 feet, white, some black under chin, upper side of flipper black; (3) cow, 39 feet, black with white blotches, upper side of flipper white, with one or two dark marks at the extremity.



MEGAPTERA.
Taken by Telephoto Lens by Dr. Mackay, Dundee.

Every one of the *Megaptera* is more or less covered with barnacles (*Coronula*), and at the base of the barnacles and in the grooves of the thorax are quantities of "lice" (*Cyamus*) of a large size. The Norwegians say these whales try to rid themselves of these parasites by rubbing against rocks.

One of my Norwegian friends told me of a *Megaptera*, caught off Finmark, 50 feet long, and 16 feet in diameter, which yielded 125 barrels of oil; this, however, must have been a most unusual case, the average yield of oil being 30 to 40 barrels.

Food of Whales.

Balænoptera musculus.—In 1903, for about one month from 12th June, the Finner whales lived mostly upon herrings. After that they fed upon shrimps and "kril" (*Thysanopoda inermis*). For a short time during the change of food they fell off in condition, but soon got fat again upon crustaceæ.

This year whaling began, at the Ronas Voe stations, on April 16th, and at the Collafirth Alexandra station on 2nd June. On 13th June a whale at the Shetland station was found with herrings inside. On 22nd July, at the Alexandra station, I found some herrings in a Finner; the same day at the Shetland station another whale was opened with herrings. On 19th August a Finner was got with some two barrels of herrings inside. The captain of the steamer that killed it said he saw no kril in the sea when he was out that time. After that it was the invariable rule at the Alexandra station to find herrings in the whales. It has also been remarked to me that the kril-fed whales of this year (1904) were fatter than the herring-fed whales of last year (1903).

It is certain that the Finners which last year fed largely on herrings, fed this year upon shrimps and kril. Last year, till well on in July, there was little kril in the Faroe seas, and it was the same off Shetland. This year kril and shrimps were plentiful till the middle of August on the north and east coasts of Shetland. But a curious circumstance must be mentioned. One of the Ronas Voe steamers has been getting its whales up to 100 miles north-west of Shetland, and these whales are entirely shrimp-fed. The manager thinks that there is a warm current in which the shrimps and kril live which attract the whales. Certainly on the east coast, where late in August there were no shrimps, the whales lived on herrings instead of shrimps. I think these observations prove that Finner whales only eat herrings when kril and shrimps are not to be got. It is certain that these whales prefer kril as a food to herrings; moreover, the herrings which came to the Shetland coasts this year must have passed through the army of Finners, forty miles off land, with impunity.

What I have observed this year in the stomachs of these whales were kril, shrimps, herrings,[1] and, in one case, sand-eels. One Finner had a piece of strong fish-bone, about four inches long, at the back of the tongue.

HUMP-BACKS (*Megaptera*), of which I examined three, had fed on kril and a few shrimps.

One SPERM WHALE, 56 feet long, was got at the Alexandra station. I examined the contents of the stomach, which at first have an offensive smell, but this passes away, as in ambergris. The stomach contained parts of a large skate, cuttle-fish beaks, the jaw-bones of an Angler (*Lophius*), the head of a shark 28 inches long, and some pieces of blubber from *B. musculus*, seemingly swallowed by the shark before the sperm whale swallowed it.

These remarks may throw some light on the food of these whales. The Finner revels when he gets among kril. He swims on his side with his mouth open and swallows them by the barrel-full; but I am convinced that he only takes to herrings when he cannot get his favourite kril and shrimps.

GROWTH OF *B. MUSCULUS*.

I am more and more convinced that the growth of Finner whales is very rapid, and the opinions of the managers of the four whale stations in Shetland agree with mine. The calf is very large when born. I am told of one fœtus 22 feet long, coloured like the adult, with baleen in the jaws; the length of the mother was 75 feet. Others have found fœtuses 20 feet long; so I think we may take the length of the fœtus at 20 feet. Lately a fœtus of 16 feet was got, the baleen of which had not begun to show, and the manager took this as a sign that it had not completed the period of gestation. The growth of the calf is very rapid. Sucking calves of 40 feet have been seen, and the general opinion of the Norwegians is that one of this size is not over a year old. The calf is supposed to go one year with the mother before it is weaned; at from two to three years the young cow is mature and ready to breed. I examined a young cow of 51 feet supposed to be under two years old. The slits in

[1] The Shetland station had six whales with herrings, and Alexandra station twenty-one.

which the teats are would not open, so we thought she was a heifer not matured. One can generally guess at the age of a whale by the size of the head; the body grows very rapidly, but the growth of the head is slower. A whale with a small head and short jaw-bones show it to be a young whale, though the body may be full sized. They soon reach 65 feet, the average length of a Finner.

I have the following records of fœtuses :—

Cow	76 ft.	had a	fœtus of	4 ft.	Cow	65 ft.	had a	fœtus of	7 in.
,,	75	,,	,,	6 ,,	,,	60	,,	,,	8 ft.
,,	75	,,	,,	7 ,,	,,	62	,,	,,	12½ ,,
,,	63	,,	,,	4 ,,	,,	68	,,	,,	3 ,,
,,	78	,,	,,	7 ,,	,,	64	,,	,,	4 ,,
,,	73	,,	,,	3 ,,	,,	63	,,	,,	10 ,,
,,	63	,,	,,	6 in.	,,	50	,,	,,	2 ,,
,,	73	,,	,,	2½ ft.	,,	65	,,	,,	2½ ,,
,,	71	,,	,,	5⅓ ,,	,,	65	,,	,,	16 ,,

This last had no baleen plates, which when the calf is ready to be born are about 2 inches long. These records are worth some notice, as they show considerable difference in the size of the fœtus. The last one had probably to grow 5 or 6 feet before birth and had to get its baleen. It would then be a young monster one-third the length of the mother. The size seems incredible, but at parturition there are no bones to impede the birth, only elastic flesh and blubber, which renders the process an easier one than in the case of limbed mammals. The instance of a cow 50 feet having a fœtus of 2 feet, shows that the cows mature at an early age. The whalers would gladly spare the cows, but it is impossible to tell the sex of the living whale.

I sketched a fœtus of 10 feet. The lower parts of the body were pink, with deeper red towards the tail. The back was of a dark purple colour. I am told that when the calf is about to be born the colour assumes that of the adult. The above fœtus had the throat grooves, and was very like a full-grown whale in miniature; it had a breadth at the thorax of 15 inches.

I have before remarked that bulls may grow as long, but they are not as a rule as fat as cows, especially if the cow is with calf,—and the larger the fœtus the fatter the cow; but

after suckling the calf for some time, the cow gets thin,—it is naturally a great strain upon her. I have pointed out that the calf grows very quickly ; inspection of the mammary glands shows that the cow produces an immense quantity of thick, yellow milk, like cream, capable of supplying the calf with abundance of rich nourishing food.

Period of Gestation and Age.

These are questions at which we can only guess, nothing definite being known about either. I am inclined to believe that the period of gestation is not more than a year, perhaps eleven months, for, as I have already said, it is a very quick-growing creature. In this I am supported by whalers who have had long experience and far better opportunities of studying whales than I have.

I think the rule is recognised that where an animal arrives quickly at maturity the age it attains is short. I am inclined to believe that forty years is about the limit of a whale's life. I have noticed some whales have the blubber hard and yellow, which indicates age, as hard yellow fat in beef shows a cow to have been old. My friend Mr. Föden told me he got a blue whale (*B. sibbaldii*) at Iceland with grey hair at the end of the baleen, and evidently very old. I can only hear of one case where a naturally dead whale was found at sea, although the skipper of a Shetland smack said his anchor once brought up some baleen plates ; but a dead wild elephant in Ceylon is just as rare. Whales are certainly subject to disease. I lately saw a bull Finner with a tumour on the penis 15 inches in diameter. After all, the age of Finner whales, and the period of gestation, are subjects upon which we can only speculate, and about which we will probably never learn anything definite. In other species of whales these may be different. Old Greenland whalers here tell me they have seen the calf of *Balæna mysticetus*, only 12 feet long, accompanying the mother.

Baleen Plates.

From two Finners 67 feet long I counted the number of baleen plates—375 a side. I only counted one side, as I

suppose the sides correspond. There are also some thick hair-like bristles at the thorax end of the baleen, about 12 a side.

In a *Megaptera* of 45 feet long there were 325 plates of baleen on each side. I have seen a double plate of baleen from a Finner. It looked as if two had grown together. Whalers roughly calculate 2 cwt. of clean baleen from a Finner. But taken freshly from the jaw, I think the baleen must weigh 4 cwt.

In many parts of the Finner whale there is a considerable amount of glue, but the difficulty exists that it will not settle when treated. In the skin between the epidermis and the blubber the glue is more easily treated and more plentiful. Before next year three of the four stations in Shetland will be supplied with manure works, and the carcases will then be worked up entirely. At present all the oil made in Shetland is sold in Glasgow. The market for the baleen is Paris.

Since writing the above I have been given the figures of the Olna station, Shetland, by the kindness of Mr. Henriksen. Fishing with four steamers, the Company got a total of 179 whales—174 Finners, 2 *Balænoptera borealis*, and 3 Humpbacks. The measurements of the Finners seem too small in this case. The figures work out

101 bulls average length 58.1 feet.
73 cows „ 58.5 „

The cows still have the largest average, though the lengths of the two biggest bulls are given as 62 and 62 feet; the lengths of the two biggest cows as 61 and 61 feet. One uniform way of measuring is much to be desired. The proportion of bulls to cows is interesting, 58 per cent were bulls to 42 per cent of cows.

The two *B. borealis* were 38 and 37 feet. Of the *Megaptera* the lengths given are 46, 47, and 49 feet, of which the two last were bulls.

Ollaberry, Shetland.



The Twins of *B. sibaldii*.

YOUNG OF SIBBALD'S RORQUAL (*BALÆNOPTERA SIBBALDII*).[1]

By J. A. Harvie-Brown.

PLATE IV.

WHEN in Eide Fjord, Faroe, in June 1894, we had an opportunity, thanks to Herr Grön, of inspecting the whaling steamer "Urd," and upon the 25th we had the further opportunity, of which we also fully availed ourselves, of inspecting the whole station, and of seeing a specimen of a "Blue fish," (*Balænoptera sibbaldii*) towed in, hauled up, and flensed, etc.

This specimen was a female, 60 feet long, including whole side measurements, and was not reckoned a large one. The great harpoon was buried haft deep in the back on the left side, and had passed below the back bone, smashed up the aorta, but, most fortunately, missed doing injury to the womb.

Flensing had proceeded till the "blanket" had been removed from the entire right side: and now, the huge carcase, resting on the belly, on being slightly pulled over by the crane, burst open; and a river of blood and entrails ensanguined the sea for a distance of at least forty or fifty yards. The great jaws had been severed and hauled up the slip to the guillotine, and the entire symmetry of the "form" had been destroyed. The great 14 feet broad flippers had been lopped off by a few rapid slicing cuts of the "krang-knives," and already natives from all parts of the Fjord and district were collecting round the carcase like vultures, and the lovely-looking brisket junks of beef were being cut off, each piece about two feet square, and were being piled up for distribution. One of the hands was standing on the back cutting down with swinging strokes of a broad-bladed and heavy axe, into the dark purplish red beef, along the side of the vertebræ; and reaching at every stroke down to the "giant's ribs," as we could clearly *hear* when the iron met the bone.

Now came to view the womb untouched; and in it, and

[1] I do not approve or accept the *late unnecessary and confusing change in its name*, *vide* True's "Whalebone Whales of the N. Atlantic," where he shifts the synonym "rostratus" to Sibbald's whale.

still attached by the umbilical cord were *two calves*. An extra haul over from the windlass on to pier, preparatory to flensing the other side, caused the womb to burst, and two young, *still warm*, lay out on the ensanguined shore.

"You don't want these," I said to the manager, who stood beside me. (I must explain, there had been great unwillingness to "part" with even single specimens of the baleen just before.)

"No! no! no!" he said hesitatingly; but I had given my men the hint and they were already lifting up the two young, preparatory to carrying them to our boat, to remove them to the yacht, which lay in the offing. They were both males: length of one, 6 feet; the other, about 4 feet. Afterwards they were sent on to the Museum at Edinburgh (now the "Royal Scottish Museum"); one was retained there, and the other sent on to the University Anatomical Museum. Prof. Turner and Dr. Traquair afterwards, when examining them, pronounced them to be the young of Sibbald's Rorqual. The mother was not therefore a large Blue Whale, being 60 feet, because the larger ones of this species reach considerably greater measurements, even to 76 or 80 feet.

I fancy some interest ought to attach to such juvenile examples, 6 and 4 ft. long respectively, and to the fact of their being *twin brothers*; but I am not aware that anything respecting them has appeared. I am only assured, that such a "double event" is *rare*, according to all experience of the Fin Whale Fishery employees; as may also be gathered from a perusal of Mr. Haldane's interesting paper. The general consensus of opinion and observation is that such is of extreme rarity. Therefore I have considered it desirable to give the record here along with the accompanying reproduction of a photograph taken by Mr. Norrie, on the spot.

Mr. Haldane has drawn attention to the doubtful nature of our information as regards the slowness or the rapidity of the growth of the young *in utero*, and consequently, on the general growth and ages to which whales attain.

The above notes, I think, should help a little at least, towards some solution, if compared with others of Mr. Haldane's remarks—hearing as he did of one fœtus of 22 feet in length, and of another of 16 feet in length.

NOTES ON THE BIRDS OF ST. KILDA.

By Rev. Neil Mackenzie.

Compiled from his Memoranda by Rev. J. B. Mackenzie, F.S.A. (Scot.).

My father went to St. Kilda in 1829, and during the fourteen years which he spent there as missionary, was always much interested in the birds which frequented the island. On his arrival he found, as he expected, that the inhabitants were both temporally and spiritually far behind the rest of the country. Full of energy and enthusiasm, he not only attended zealously to their spiritual interests, but at once set about to improve their temporal condition in many ways. This necessitated his being almost constantly with them, as they would do nothing out of the old routine when left by themselves. In order to gain their confidence he went frequently with them on their fowling expeditions, and did not hesitate to go with them into what they considered the most dangerous places. In this way he not only heard all that they could tell, but made constant observations on his own account. I remember when I was a lad, and he was my teacher, that he always made me do my compositions on bird subjects. This, I think, it was that led himself to note down from time to time, during 1840 and 1841, the results of his own observations. Several of these notes are lost, as they were written at different times on separate pieces of paper. I have copied out all I can find. There is nothing about the Great Auk [*Alca impennis*], but from conversations which I have had with him I know that he made all possible inquiry. None of the natives then living had ever seen it, but they had heard of a bird of that kind, which they vaguely described. After consideration of all that he could ascertain about it, his conclusion was that at the time when the island was uninhabited it did breed there in some numbers, but that after the island was inhabited it gradually got exterminated by the frequent robbing of its eggs. This could very easily be done, as the places where it could land and breed were very few, and all on the main island and near the village.

I now come to what I find recorded, and give it as nearly

as possible in my father's own words. I leave out a few repetitions and bring together all that is said about any one bird.

Of the land birds which are resident, the largest is the RAVEN [*Corvus corax*], and the most numerous the HOODED CROW [*Corvus cornix*] and the STARLING [*Sturnus vulgaris*]. There are also resident two species of HAWK, a few SNIPE [*Gallingo gallinago*], the ROCK PIPIT [*Anthus obscurus*], and the WREN [*Troglodytes parvulus*]. The TWITE [*Linota flavirostris*], the WHEATEAR [*Saxicola œnanthe*], are summer visitors. The BLACKBIRD [*Turdus merula*], and the THRUSH [*Turdus musicus*] are regular winter visitors. The SWALLOW [*Hirundo rustica*], the ROOK [*Corvus frugilegus*], the PLOVER and the EAGLE are occasional visitors. A few WOODCOCK [*Scolopax rusticula*] come generally in November but not regularly. Two or three HERONS [*Ardea cinerea*] at a time come about every fourth year and die of starvation. The CUCKOO [*Cuculus canorus*] is a still rarer spring visitor, and the natives say that it comes to bring some news of importance, such as of a visit from the proprietor or of his marriage or death. During stormy weather in October a few WILD GEESE and a SWAN or two visit the island. Also more regularly a species of small duck and an occasional EIDER DUCK [*Somateria mollissima*]. In November, under the same conditions, a few more GEESE and SWANS will arrive with a few MALLARD [*Anas boscas*], but they seldom at any time remain longer than a few days. One day some village boys noticed a SWAN in the broken water at the head of the bay and would not allow it to land. As the day was quite calm with a heavy surf it never could rise high enough to overtop the curling surf. It swam about for hours in the space between the sand and the breakers, but at last, quite exhausted, it laid down its head and floated ashore. It lay so quiet that I thought it could be tamed, and brought it home, and shut it up for the night in a bedroom. Fortunately I tied it by the foot to a bed-post, for next morning when it revived it smashed everything within reach, and was so furious and aggressive that it had to be destroyed.

The SANDPIPER [? Ring Plover, *Ægialitis hiaticula*] is the

only resident wader. In fine weather you hear them day and night piping along the shore. In stormy weather they frequent the fields.

The BLACK-BACKED GULL [*Larus marinus*], here called "farspock," is fairly numerous and arrives about the middle of spring. They are greedy birds, feeding on carrion as well as fish, sometimes even attacking lambs. It weighs about five pounds, is two feet five inches in length, and has a spread of wing of five feet and a half. It makes a nest lined with grass on the top of some high rock, or on grassy tufts among the steep ledges, or among the grass in steep and almost inaccessible places. About the 10th of May it lays three or four eggs, which it hatches in five weeks. It feeds its young in the nest for about four weeks, after which it takes them down to the sea. When they are fully fledged all take their leave except a very few, which remain all winter.

The HERRING GULL [*Larus argentatus*] comes about the same time as the preceding, and resembles it in most of its habits. It is here called "faolag," and the young of both are called "scuirag." Many remain all the year.

The KITTIWAKE [*Rissa tridactyla*] arrives in great numbers late in the spring. It is here called "ruideag." It is a very much smaller bird than either of the above, weighing little more than half a pound. It is the only one of the gulls which is at all eatable, but as it is only fair eating and always rather lean, it is very seldom cooked. Early in May it makes its nest in very inaccessible places, and if possible where it has the protection of an overhanging cliff. It lays four eggs, which the parents hatch by turns for four weeks. I have often seen the one trying to get the other off the nest that it might take its place. It is a very harmless and affectionate bird, and much more social than any of the other gulls. They come to the island together, fish together, and make their nests together. I have never seen them fight or in any way molest each other. In fishing it shoots like an arrow along the surface of the water. It takes the whole summer to hatch and rear its young, and as soon as they are fully fledged they, like the other gulls, almost all depart. Those few which winter here seem to be generally young birds.

There are three species of Petrel which visit the island, and they have many things in common. They are all able with outspread wings to run along the surface of the water, patting very quickly with their feet. They are all extremely fat, and have in their stomachs a quantity of pure oil which they can squirt over an assailant. And they all lay but one egg, which is white and very large for the size of the bird.

The FULMARS [*Fulmarus glacialis*] are almost resident, as they only leave about the middle of August and return early in October. They are only away about five or six weeks. They are not, however, every day about the rocks. They only come on shore when the wind is westerly, any point from S.W. to N.W. It weighs about eighteen ounces and is about fifteen inches in length. I have seen a few specimens which were entirely white. The young when about fledged are in general much heavier. I have weighed some which were upwards of two pounds. It begins to lay early in May, and does not select for its nest the more inaccessible rocks, but prefers those places where there are steep grassy slopes with tufts of earth or sorrel. It frequents every slope of this description, numerously in the Island of Soay and St. Kilda, and sparingly in the Boreray group, which are frequented by the Gannet. It lays one egg, which the parents hatch by turns for about six weeks. If the nest is robbed they will not lay a second time. When the chick is hatched both parents take great care of it and feed it most assiduously for six or seven weeks, so that it is generally very fat. In a season when the circumstances are favourable a large number of these young birds are killed. On an average twelve thousand will be killed as they are about ready to leave the nest. I estimate that the average number of young Fulmars hatched will be about twenty thousand. These represent forty thousand parents. There are also a large number of birds which either do not find suitable partners or are confirmed celibates, bringing up the total to about fifty thousand. These will take with them about eight thousand young birds when they leave, which seems to be sufficient to keep up their numbers and no more. At times a few old birds are caught by means of the snaring rod, like the Puffin and the Guillemot, but not

many, as they wish to get as many young birds as possible. For the same reason also very few of the eggs are taken. There is not very much danger in taking them, as the places which they frequent are comparatively easy of access. Lives are occasionally lost in hunting the Fulmar, as one may accidentally slip, but when it does happen it is generally from trying to rob some of the few places where a rope ought to have been used. About the beginning of August the young Fulmars are about fully fledged and ready for killing. During the preceding week an unusual excitement and alertness pervades the village. Every possible preparation is being made. The women bring the cattle home from the sheilings, grind sufficient meal to last the killing time, while the men test the ropes, make good deficiencies, and provide barrels and salt. Other fowling is really hardly anything more than amusement, and may almost be prosecuted or not as you like, but for ten days at this time it is quite different. I have often said in these notes that the men were to-day doing so and so, when all I meant was that they did something at that but nothing else, but now the whole village is astir and hard at work. A large and valued portion of the winter's food must now be provided or you have to do without it. The breeding-places have all been carefully examined some time before, and an estimate made of the young birds which they respectively contain. They are now divided into as many portions as there are groups of four or five men who are to work together. These portions are now assigned by lot to each group, and all is ready. When the day considered most suitable comes all move off to the rocks, and the men either climb down to the breeding-places or get lowered by rope if necessary. The birds must all be caught by hand, and skilfully too, or much of the valuable oil will be lost. They must be caught suddenly and in such a way as to prevent their being able to draw their wings forward or they will squirt the oil. It cannot do this easily while you hold the lower joints of its wings back against each other. Caught in the right way its neck is speedily twisted and broken and the head passed under the girdle. When the man has got strung about him as many as he can conveniently carry, they are passed up to the

women who are waiting above. At once they are divided into as many shares as there are men in the group, when the womenkind and children seize upon their shares and begin to drain out the oil into receptacles, which are generally made of the blown-out and dryed stomachs of the Gannet. This they do by the very simple means of holding the bird bill downwards and gently pressing, when about a gill of oil flows out by the bill. This oil is much valued, some used by themselves for various purposes and the surplus sold. When all are got home, plucking off the feathers, disposing of the internal fat, and salting the carcases for winter use, goes on till far in the night. Early the next morning the same round begins, and so on from day to day till all the accessible breeding-places are visited. All this time there is nothing but birds, fat, and feathers everywhere. Their clothes are literally soaked in oil, and everywhere inside and outside their houses nothing but feathers ; often it looks as if it were snowing.

(*To be continued.*)

THE BIRDS OF THE FLANNAN ISLANDS; OUTER HEBRIDES.

By Wm. Eagle Clarke.

(*Continued from p.* 19.)

Merganser (*Mergus serrator*).—The only record relates to the occurrence of a female on the 20th of April, 1903.

Ring Dove (*Columba palumbus*).—On the 1st of July 1904, one was observed resting on the island at 3 P.M. ; the only record.

Turtle Dove (*Turtur turtur*).—In the first week of September 1900, one appeared on Eilean Mhor and after remaining a week was shot on the 14th. Its wing, sent to me for identification, was that of a bird of the year.

Land Rail (*Crex crex*).—This species has been detected as a casual migrant visitor to the island on three occasions, namely, on the 5th of June 1902 ; on the 8th of May 1904 ; and lastly on the 15th of September 1904, during our visit.

Ring Plover (*Ægialitis hiaticula*).—Visits the island occasionally during the autumn. On the 12th of September, a single bird in immature plumage appeared, and was followed by another and similar bird on the 19th. This pair frequented the bare patches among the sea-pink on the top of the island down to the date of our departure.

There are several previous records of the visits of this species, all for August, and three seems to have been the largest number observed on these occasions.

Golden Plover (*Charadrius pluvialis*).—Occurs on passage, in both spring and autumn, arriving in small parties which do not remain long on the island. The first visitors during the autumn of 1904, were four birds which appeared on the 12th of September. These were followed by a few others on the 13th and 17th.

The latest recorded date for their autumnal visits is the 9th of November, and the earliest the 28th of August.

The date of the spring movements north ranges from the 8th of April to the 1st of May.

Lapwing (*Vanellus vanellus.*)—Occurs regularly on passage in both spring and autumn, but only in small numbers. There is a record of its appearance in winter, namely, a single bird on the 5th of January 1903.

We had only one visit of Lapwings during our stay. On the 13th of September three appeared in the early morning and remained a few hours on the island.

It occurs also during October and November, the 20th being the latest date for its visits in the autumn.

In spring its appearances as a migrant range from the 12th of March to the 12th of May.

Turnstone (*Strepsilas interpres*).—Occurs occasionally during the autumn passage and in winter; but the island with its precipitious sides affords little attraction for this bird, and they do not remain long. We observed a single bird on the 7th of September; and two appeared on the 10th and remained for several days, during which one of them fell a victim to the Peregrine Falcon. These birds, like the Ring Plovers, frequented the bare patches amid the sea-pink on the top of the island.

Woodcock (*Scolopax rusticula*).—Appears to be observed on the autumn passage and occasionally during severe weather in winter. Small numbers occur annually in October and November, the 16th of the former month being the earliest date chronicled for their appearance. Three were killed at the lantern on the 5th of November 1902.

Oystercatcher (*Hæmatopus ostralegus*).—A common summer visitor to the islands. Several pairs nest on Eilean Mhor.

These birds arrive in March, the 7th of the month being the earliest date recorded for their appearance; and they leave along with their young in August. We saw only a single example during our visit, namely on the 14th of September.

Common Snipe (*Gallinago gallinago*).—A frequent visitor, though usually appearing in small numbers, during the spring and autumn migratory movements; also an occasional winter visitor. On the 17th of February, 1904, during snow, great numbers appeared; and a "rush" is chronicled for the 10th of December of the same year.

The spring passage commences about the middle of March, and the bird has occurred as late as the 11th May.

A few were observed during our visit, the first of which appeared on the 14th of September. It also occurs at intervals in October and November.

Great Snipe (*Gallinago major*).—Mr. Begg, who is quite familiar with both the Common and Jack Snipes, tells me that he got quite close to a bird of this species on the 3rd of October, 1904.

Jack Snipe (*Gallinago gallinula*).—The chief migratory movement witnessed during our visit was a very remarkable one on the part of this species. The first immigrant was observed by us on the evening of the 14th of September, and this was followed on the night of the 16th or early hours of the 17th by a great rush. The morning of the 17th was characterised by a high wind from the south-west accompanied by a downpour of rain. On venturing out soon after 8 A.M., I found the island swarming with Jack Snipe. They were in astonishing numbers, and sheltering behind rocks, tufts of grass, in the small pools and runnels, and even down the face of cliffs on the north side of the island. In walking across the island I put up a continuous stream of them, in spite of the fact that the birds sat like stones and only those arose on the wing which lay in my course and when I was close upon them. It was a most remarkable experience and one entirely unexpected both on the part of the species and the locality. I believe that a record "bag" could have been made on this sixteen-acre island, in an hour's shooting. It was surprising too, to find that the Jack Snipe migrated in such vast packs. I have no doubt that they were abundant on the other islands of the group, and probably especially so on the adjacent and comparatively flat-topped Eilean Tigh. The birds were present in numbers the entire day, but nearly all, perhaps all, departed during the night, and the few (eight) seen on the following day may have

been fresh arrivals, as may also those observed on the 19th and 20th.

Each year a small number visit the island at intervals on the autumn passage, but the earliest date for their appearance hitherto was on the 1st of October in 1902; and in most years it is not until November, which is the chief month for their arrival, that they are recorded; and four appears to have been the largest number seen in any one day previous to the rush just described. In 1902 one was seen on the 1st of February —the only winter record.

Dunlin (*Tringa alpina*).—The islands afford no suitable feeding grounds for this bird, but a few visit them during the seasons of passage.

Two of these migrant visitors came under our notice, namely, one on the 8th of September and another on the 16th.

Knot (*Tringa canutus*).—The wing of a knot killed at the lantern on the night of the 18th November 1902, was sent to me for identification, and is so far the only evidence we have of this bird's occurrence at the Flannans.

Purple Sandpiper (*Tringa striata*).—A few are observed during the winter months, and their identification established from wings sent to me. None of these birds had put in an appearance during our visit. The earliest record for their arrival is for 10th October 1904.

Redshank (*Totanus calidris*).—Two records only: one on 28th of May 1903, and another in rush of Redwings, Larks, Wheatears, Starlings, etc., on the 15th of April 1904.

Curlew (*Numenius arquata*).—A regular visitor on passage in both spring and autumn. In spring it appears early in April; and in autumn from the first week in August to mid-November, sometimes in fair numbers. A few small parties came under our notice on the 11th, 12th, and 13th of September.

Whimbrel (*Numenius phæopus*).—It would seem probable that before the lighthouse buildings were commenced this bird was a summer visitor to Eilean Mhor, for during the first summer the artizans were engaged there a nest was found near to the ancient building known as the "Blessing House," and the eggs taken for food. Mr. Begg had this information from a man who was present and who knew the birds well.

The Whimbrel is observed annually on both its passages, appearing from the very earliest days of May down to the 22nd of the month, the latest date for which it is recorded in spring. The return autumn movement is witnessed from the last days of July until mid-September. We saw only two birds of this species, namely on the 15th September.

Arctic Tern (*Sterna macrura*).—A few appear annually off the islands in June, but do not remain to nest. We did not see this bird, nor did any other species of Tern come under our notice.

Greater Black-backed Gull (*Larus marinus*).—About two pairs are resident on Eilean Mhor and nest there; and a few are also to be found on the other islands during the summer months.

During our stay both old and young were seen daily in some numbers.

Lesser Black-backed Gull (*Larus fuscus*).—Does not nest on the main island, but is often seen there during the summer months. Mr. Harvie-Brown found a colony on Eilean Tigh, in June, 1881.

This species had practically left the islands before our visit, for only one adult and a few young birds came under notice.

Herring Gull (*Larus argentatus*).—About six pairs only breed on Eilean Mhor, but many resort to the other and more secluded islands of the group. A party consisting of about a score birds was present during our sojourn and remain on Eilean Mhor throughout the winter, being attracted by the refuse thrown out from the lighthouse.

Kittiwake (*Rissa tridactyla*).—The commonest Gull during the nesting season. They arrive in great numbers at their breeding cliffs late in February, and evidently depart early in the autumn, for we did not observe a single adult example during our visit, but a few in first plumage were present.

Richardson's Skua (*Stercorarius crepidatus*).—Two observed on the 28th of August 1903 are the only birds recorded.

Razorbill (*Alca torda*).—Thousands of these birds haunt the cliffs during the nesting season. They arrive late in February or in March. We did not see the Razorbill in the vicinity of the islands: all had departed before our arrival on the 6th of September.

Guillemot (*Uria troile*).—Vast numbers make their homes in the cliffs during spring and summer, arriving from the middle to the end of February. They had quitted their breeding haunts before our visit, and we only saw old birds accompanied by their full-grown young at some distance from the islands on the occasions of our arrival and departure.

Black Guillemot (*Uria grylle*).—This characteristic West-Coast species thins out in the Hebrides, and we have no evidence, as yet, that it breeds on any of the Flannan Islands. It is possible, however, that a few do, and that they have escaped notice among the vast crowds of rock birds present during the summer. We observed odd birds, sometimes a pair, close to the base of the cliffs of Eilean Mhor on several occasions.

PUFFIN (*Fratercula arctica*).—The commonest summer visitor to Eilean Mhor and probably to the other islands of the group. On the top main island there are colonies of thousands in those parts where the turf is suitable for the formation of their burrows, and in addition vast numbers resort to the holes and crevices on the face of the cliffs.

The great breeding crowd had left ere we arrived, and the very few that remained were detained by their unfledged young, some of which were still half-clad in down. The industry of this comical bird is marvellous. We sometimes sat near their burrows, and the constancy with which the old birds arrived with strings of fish hanging from their bills, was quite remarkable; they seemed to be coming in every few minutes, and the young must surely be very voracious little creatures.

SCLAVONIAN GREBE (*Podicipes auritus*).—We observed a bird of the year on the 16th of September, off the east landing place. A strong southerly breeze prevailed at the time and the bird found there a convenient harbour, and passed the entire day in diving and sleeping. It often came quite close to the face of the rocks from which we were watching it.

STORM PETREL (*Procellaria pelagica*).—Very numerous during the summer, when they fly noisily about the island during the night-time. They breed on Eilean Mhor, and probably on the other islands, in abundance. Many chicks, some of them quite recently hatched, were found during our visit in September, and we saw young ones in every stage from a few hours old (tiny balls of pretty lavender grey down) to birds full-grown and fully feathered, except that they had a bunch of down still present on the lower part of the abdomen. The old birds were entirely absent during the daytime, leaving even the small chicks to take care of themselves, and do not return until darkness sets in, when they tend to their young and depart again in the early morning, probably to spend the day far out at sea in search of food. We opened out a number of their nesting holes at all hours of the day, but the old birds were always absent, except in one instance where the young had only recently emerged from the egg. Occasionally they visited the lantern. They nest in the remains of the old buildings, in holes in turf, and under stones among grass. The nest is a mere mat composed of dry roots, grass, etc. I received a young one in full down which had been taken on the 3rd of October; probably the first egg of this pair had been taken or destroyed.

LEACH'S FORK-TAILED PETREL (*Oceanodroma leucorrhoa*).—The Flannan Isles may be regarded as one of the chief breeding stations of this species in the British Isles—and will probably

long remain so, thanks to the inaccessibility of these islands. On Eilean Mhor they are abundant, more so than the Storm Petrel, and like that species fly noisily over the island during the long summer nights. They lay earlier than *pelagica*, the earliest date for their eggs being the 29th of May, but their nesting habits are very similar. We found their nurseries under stones among turf; in holes in turf overgrown with grass, yet showing not the slightest signs of the incomings or outgoings of the parents; and among the stones forming the old buildings. In some of the burrows the mat-like cradles of roots and fibrous vegetable matter were placed several feet from the entrance. The chicks are much darker in colour than those of the Storm Petrel, being sooty black; they were also as a rule a little more advanced, but youngsters only a few days old were found during the early days of our visit, as well as others in every stage up to those almost ready to fly. The old birds were entirely absent during the daytime, and only occasionally came under notice at night when they visited the lantern.

Fulmar (*Fulmarus glacialis*).—A few pairs have bred on the outer islands for several years, and in 1904 two couples had nests on Eilean Mhor for the first time.

They are recorded as appearing as early as 17th of February, and are sometimes seen in considerable numbers in April and May. We saw this bird on several occasions during our visit.

Great Shearwater (*Puffinus gravis*).—On leaving the islands on the 21st September we saw from the bridge of the "Pole Star" a few of these birds at sea a little distance off the Flannans.

Correction.—For 'Eilean Mhor' throughout this paper, *read* 'Eilean Mòr.'

Royal Scottish Museum, Edinburgh.

TIPULIDÆ IN SHETLAND AND KIRKCUDBRIGHT.

By Robert Henderson.

The perusal of Mr. Grimshaw's list, No. IV. of his very welcome series of papers on the distribution of Diptera in Scotland, reminded me of two collections of flies belonging to the families *Ptychopteridæ*, *Limnobidæ*, and *Tipulidæ*, which Mr. James J. F. X. King, F.E.S., of this city, very kindly made for me a few years ago.

One of these collections is from the Shetlands, and the list of the species taken, although it contains no rarities, forms a considerable supplement to the published records which Mr. Grimshaw has very conveniently brought together. The flies were taken in the summer of 1901, from 21st June to 23rd August, near Cunningsburgh, eleven miles south of Lerwick, on Mainland; and at Barrafirth on the north, Baltasound and Haroldswick on the east, and Woodwick on the west side of the island of Unst.

The other collection was made at localities within five miles of the town of Kirkcudbright, during July and August, 1900, and comprises a number of species which I have not seen recorded in Scottish lists.

I.—SHETLAND.

Family PTYCHOPTERIDÆ.

PTYCHOPTERA ALBIMANA, *F.*—♂ ♀, Cunningsburgh, 26th June

Family LIMNOBIDÆ.

LIMNOBIA FLAVIPES, *F.*—♀, Barrafirth, 18th July.

DICRANOMYIA MODESTA, *Mg.*—♂ ♀, Cunningsburgh, 21st June.

DICRANOMYIA DIDYMA, *Mg.*—♂, Cunningsburgh, 21st June; 5 ♂ ♂, Cunningsburgh, 28th June; ♂ ♀, Woodwick, 13th July.

GONIOMYIA TENELLA, *Mg.*—♂, Cunningsburgh, 28th June; 1 ♂ and 2 ♀ ♀, Haroldswick, 4th July.

GONIOMYIA *sp.*?—♀, Cunningsburgh, 21st June; ♀, Cunningsburgh, 22nd June.

ERIOPTERA TÆNIONOTA, *Mg.*—♀, Cunningsburgh, 23rd June.

ERIOPTERA FUSCIPENNIS, *Mg.*—♂, Cunningsburgh, 26th June.

ERIOPTERA TRIVIALIS, *Mg.*—♂ ♀, Cunningsburgh, 21st June; ♀, Cunningsburgh, 26th June.

SYMPLECTA STICTICA, *Mg.*—1 ♂, 1 ♀, and 1 with part of abdomen broken off, Baltasound, 9th August.

LIMNOPHILA MEIGENII, *Verr.*—♂ ♀, Cunningsburgh, 21st June.

LIMNOPHILA NEMORALIS, *Mg.*—2 ♂ ♂, Cunningsburgh, 21st June, ♂ ♀, Cunningsburgh, 25th June; 2 ♂ ♂ and 1 ♀, Cunningsburgh, 26th June; 1 ♂ and 8 ♀ ♀, Cunningsburgh, 28th June; ♀, Baltasound, 9th August.

Trichocera regelationis, *L.*—2 ♂ ♂, Cunningsburgh, 21st June.

Amalopis claripennis, *Verr.*—♂, Cunningsburgh, 22nd June.

Family TIPULIDÆ.

Dolichopeza sylvicola, *Curt.*—♀, Cunningsburgh, 28th June.

Tipula rufina, *Mg.*—2 ♂ ♂, Cunningsburgh, 21st June; ♂ ♀, Barrafirth, 10th July; 2 ♂ ♂ and 2 ♀ ♀, Barrafirth, 16th July; 2 ♂ ♂ and 6 ♀ ♀, Barrafirth, 18th July; ♂, Barrafirth, 1st August; 3 ♂ ♂ and 1 ♀, Baltasound, 9th August.

Tipula longicornis, *Schum.*—♂, Barrafirth, 10th July; ♂ ♀, Barrafirth, 16th July.

Tipula scripta, *Mg.*—2 ♂ ♂ and 4 ♀ ♀, Barrafirth, 5th August; 6 ♀ ♀, Baltasound, 9th August.

Tipula lateralis *Mg.*—♂, Baltasound, 9th August; ♂, Barrafirth, 23rd August.

Tipula oleracea, *L.*—3 ♂ ♂ and 1 ♀, Cunningsburgh, 22nd June; ♂, Haroldswick, 5th July.

Tipula paludosa, *Mg.*—2 ♀ ♀, Barrafirth, 18th July; ♂ ♀, Barrafirth, 1st August; ♀, Barrafirth, 5th August; 1 ♂ and 2 ♀ ♀, Baltasound, 9th August; 2 ♂ ♂ and 1 ♀, Baltasound, 11th August; 1 ♂ and 3 ♀ ♀, Barrafirth, 23rd August.

II.—KIRKCUDBRIGHT.

Family PTYCHOPTERIDÆ.

Ptychoptera paludosa, *Mg.*, 1 ♂; *scutellaris*, Mg., 5 ♂ ♂ and 4 ♀ ♀.

Family LIMNOBIDÆ.

Limnobia nubeculosa, *Mg.*, 1 ♀; *trivittata*, Schum., 2 ♀ ♀; *Dicranomyia chorea*, Mg., 6 ♂ ♂ and 1 ♀; *didyma*, Mg., 2 ♂ ♂ and 2 ♀ ♀; *dumetorum*, Mg., 7 ♂ ♂ and 5 ♀ ♀; *goritiensis*, Mik., 2 ♂ ♂.

Rhipidia maculata, *Mg.*—21 ♂ ♂ and 10 ♀ ♀.

Empeda nubila, *Schum.*—2 ♀ ♀.

Acyphona maculata, *Mg.*—1 ♂ and 1 ♀.

Molophilus bifilatus, *Verr.*—5 ♂ ♂.

Rhypholophus nodulosus, *Mcq.*—3 ♂ ♂ and 1 ♀.

Erioptera tænionota, *Mg.*, 1 ♀; *trivialis*, Mg., 1 ♀.

SYMPLECTA STICTICA, *Mg.*—2 ♀ ♀.

TRIMICRA PILIPES, *F.*—♂, 18th August.

EPHELIA SUBMARMORATA, *Verr.*, 1 ♀ ; *marmorata*, Mg., 1 ♂.

LIMNOPHILA LINEOLELLA, *Verr.*, 4 ♂ ♂ and 3 ♀ ♀ ; *ferruginea*, Mg., 1 ♂ ; *ochracea*, Mg., 1 ♀ ; *bicolor*, Mg., 1 ♂ ; *subtincta*, Ztt., 1 ♀ ; *nemoralis*, Mg., 3 ♂ ♂ and 3 ♀ ♀.

TRICHOCERA, *sp.* ?—1 ♂ and 1 ♀.

ULA PILOSA, *Schum.*—2 ♂ ♂ and 1 ♀.

DICRANOTA PAVIDA, *Hal.*—2 ♂ ♂ and 6 ♀ ♀.

AMALOPIS LITTORALIS, *Mg.*—1, imperfect.

Family TIPULIDÆ.

PACHYRRHINA HISTRIO, *F.*, 2 ♂ ♂ ; *quadrifaria*, Mg., 1 ♂ and 4 ♀ ♀.

TIPULA LONGICORNIS, *Schum.*, 1 ♀ ; *lateralis*, Mg., 8 ♂ ♂ and 3 ♀ ♀ ; *Diana*, Mg., 2 ♂ ♂ and 2 ♀ ♀ ; *lutescens*, F., 2 ♂ ♂ and 1 ♀ ; *paludosa*, Mg., 2 ♂ ♂ and 3 ♀ ♀ ; *ochracea*, Mg., 1 ♂.

12 ARMADALE STREET, GLASGOW.

NOTES ON SOME SCOTTISH FRESHWATER RHIZOPODS AND HELIOZOA.

By Prof. G. S. WEST, M.A., F.L.S.

I. RHIZOPODS FROM THE ORKNEYS AND SHETLANDS.

THESE were collected by my father in 1903 from various bogs, ponds, and lakes, some of them being from the plankton. The only species of interest are *Heleopera petricola*, Leidy, and *Hyalosphenia elegans*, Leidy. I append a list of those species observed, as it will augment our knowledge of the distribution of these animals in the British Islands.

Amœba verrucosa, Ehrenb.—Orkneys, Shetlands.
Dactylosphærium radiosum (Ehrenb.), Blochmann.—Shetlands.
Arcella vulgaris, Ehrenb.—Orkneys (Hoy), Shetlands.
A. discoides, Ehrenb.—Shetlands.
Centropyxis aculeata (Ehrenb.), Stein.—Orkneys, Shetlands.
Difflugia constricta (Ehrenb.), Leidy.—Shetlands.

D. pyriformis, Perty.—Orkneys, Shetlands.
D. globulosa, Duj.—Orkneys.
Lecquereusia spiralis (Ehrenb.), Blochmann.—Shetlands.
Nebela collaris (Ehrenb.), Leidy.—Orkneys, Shetlands.
N. flabellulum, Leidy.—Orkneys, Shetlands.
N. carinata (Archer), Leidy.—Orkneys (Hoy).
Heleopera petricola, Leidy.—Orkneys.
Quadrula symmetrica (Wallich), Schulze.—Shetlands.
Hyalosphenia elegans, Leidy.—Orkneys.
Euglypha alveolata, Duj.—Shetlands.
E. ciliata (Ehrenb.), Leidy.—Shetlands.
Placocysta spinosa (Carter), Leidy.—Orkneys.
Sphenoderia lenta, Schlumberger.—Orkneys (Hoy).
Assulina seminulum, Ehrenb.—Orkneys (Hoy), Shetlands.
Trinema enchelys (Ehrenb.), Leidy.—Orkneys, Shetlands.
Cyphoderia ampulla (Ehrenb.), Leidy.—Orkneys, Shetlands,

Of the foregoing list some were found in the plankton of various lochs, and these I have tabulated separately. Of the species found in the plankton few can be regarded as true plankton-forms. Only *Cyphoderia ampulla* and *Euglypha ciliata* occurred in such quantity as to be unquestionably true constituents of the plankton.

Rhizopods in the Plankton of Lochs in the Orkneys and Shetlands.

Species.	Orkneys.	Shetlands.			
	L. Kirbister.	L. Asta.	L. Beosetter, Bressay.	L. Trebister.	L. Brindister.
Dactylosphærium radiosum (Ehrenb.), Blochmann					×
Arcella discoides, Ehrenb.			×		×
Difflugia constricta (Ehrenb.), Leidy			×		
D. pyriformis, Perty			×		
D. globulosa, Duj	×				
Nebela collaris (Ehrenb.), Leidy				×	
Quadrula symmetrica (Wall.), Schulze	×				
Hyalosphenia elegans, Leidy	×				
Euglypha ciliata (Ehrenb.), Leidy		×	×		×
Sphenoderia lenta, Schlumberger	×				
Assulina seminulum, Ehrenb.	×				
Cyphoderia ampulla (Ehrenb.), Leidy	×	×			×

II. Rhizopods and Heliozoa from the Scottish Freshwater Plankton.

About twenty species of these animals were met with during the investigation of the plankton of a number of lochs in the north-west of Scotland and the Outer Hebrides. Rhizopods were not very numerous in the plankton of any of the lakes, and in some the only specimens observed were empty shells of testaceous species which had doubtless been carried down into the lakes by mountain streams. I have mentioned all those observed in the collections, although few of these animals can be regarded as plankton-forms, the only ones found at all frequently in the living state being *Arcella vulgaris*, *Cyphoderia ampulla*, *Trinema enchelys*, *Euglypha alveolata*, and *E. ciliata*. Of these five species, very fine specimens of *Cyphoderia ampulla* and *Euglypha alveolata* are by no means uncommon in the plankton.

Concerning Rhizopods which occur in the plankton, Cash [1] remarks that "the open waters of a lake can hardly be considered their natural home." This is true of most of these animals, but there are certain species which undoubtedly occur constantly in the plankton, thriving well in the surface waters of lakes. Moreover, *Nebela bicornis*, described for the first time in this paper, is only known to occur in the plankton.

The table on the following page is a list of the species observed in the plankton. Those species in small capitals occurred in quantity and with a sufficient percentage of living specimens to be considered as true plankton-forms.

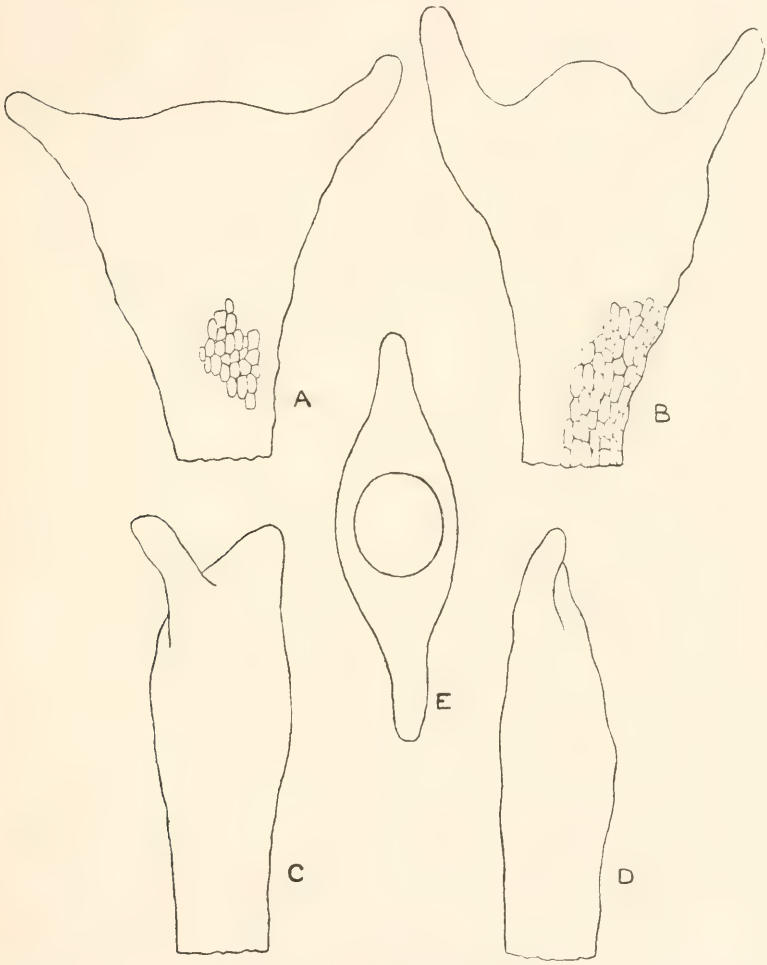
Clathrulina elegans occurred in large quantity in Lochs Luichart and Rosque, Ross.

Nebela bicornis, sp. n.—Shell rather small, from the front view triangular-pyriform, lateral margins and apex generally slightly convex, the two upper angles each produced into an outwardly diverging, obtuse process or horn, which may be straight or curved and is scarcely attenuated; close to the mouth with parallel margins; mouth very slightly

[1] J. Cash in "Jour. Linn. Soc. Zool." xxix. 1904, p. 219.

Species.	Perth.		Inverness.					Ross.		Lewis.						Harris.		
	Loch Tay.	River Lochay.	Loch na Cloiche Sgoilt.	Loch na Criche.	Loch Gorma.	Loch Morar.	Loch Shiel.	Loch Luichart.	Loch Rosque.	Loch Cuthaig.	Loch Langabhat.	Loch Roinebhall.	Loch an Sgath.	Loch Shubhaill.	Loch Stranabhat.	Loch Dirachect.	Loch a Mhorghain.	Loch Laxadale.
Rhizopods.																		
Arcella vulgaris, Ehrenb.	×						×					×	×		×			
A. discoides, Ehrenb.						×										×		×
Centropyxis aculeata (Ehrenb.), Stein					×						×							×
Difflugia pyriformis, Perty					×													
D. globulosa, Duj																		×
Nebela collaris (Ehrenb.), Leidy				×									×				×	
N. flabellulum, Leidy												×						×
N. dentistoma, Penard								×										
N. carinata (Arch.), Leidy													×					
N. bicornis sp. n.							×											
Quadrula symmetrica (Wall.), Schulze							×											
Euglypha alveolata, Duj		×					×	×				×				×		
E. ciliata (Ehrenb.), Leidy			×	×						×				×				×
Assulina seminulum, Ehrenb.							×		×							×	×	
Trinema enchelys (Ehrenb.), Leidy		×		×	×			×		×		×	×					×
Cyphoderia ampulla (Ehrenb.), Leidy			×		×		×			×	×		×					
Heliozoa.																		
Rhaphidiophrys viridis, Archer									×									
Acanthocystis chætophora (Schrank), Leidy											×							
Clathrulina elegans, Cienkowski								×	×									

and irregularly undulate. Side view of shell narrowly sub-lanceolate, apex obtusely conical and rarely curved, horns often bent. Basal view of shell elliptical with produced



Nebela bicornis, sp. n. A and B, two shells from the front view; C and D, two side views; E, basal view of shell showing mouth. (× 520.)

extremities, mouth subcircular or rotund elliptic. Shell composed of minute plates, somewhat irregular in shape and longer than their diameter, with no definite disposition.

Length of shell, inclusive of horns, 96-117 μ; breadth

across horns, 86-101 μ; breadth of mouth, 23-25 μ; thickness of shell, 29-38 μ.

Hab. Plankton of Loch Shiel, Inverness.

This species is readily recognised by the pair of diverging processes or horns, which are sometimes bent upwards almost parallel to the length of the shell. The region of the mouth is also rather peculiar in being almost cylindrical, the actual edge of the mouth showing a slight undulation. The structure of the shell is that of a true species of *Nebela*, the small plates of which it is composed being very irregular with no definite order of arrangement, but mostly disposed with their long axes parallel to the length of the shell.

In the presence of the horn-like processes the shell somewhat resembles that of *Campascus cornutus*, Leidy, but there is no curvature in the region of the mouth, and its structure is quite different.

The specimens were all preserved in 4% formalin, and all the individuals examined were more or less encysted, the body-protoplasm exhibiting the form of a globular mass in the widest part of the shell. The nucleus stained readily with hæmatoxylin or ammonia-carmine. Species of this genus are, however, all discriminated by the characters of the shell, and *N. bicornis* is no exception.

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MICROSCOPIC LIFE OF ST. KILDA.

By James Murray.

During a flying visit paid to St. Kilda in the early summer of 1904, an attempt was made to ascertain what microscopic life was to be found on the island. As our stay was very short, only three hours being spent on shore, there was little time for making natural history collections. As moss everywhere harbours an abundant population of micro-organisms, I gathered a quantity of it with a view of getting some idea of the micro fauna and flora of the island. Very little moss was, however, to be seen, the soil everywhere

having a raw appearance, due no doubt to its being continually cut for fuel. In a little trickle of water issuing from a small corrie above the village, and known, I believe, as the "Glen," I found several species of aquatic and semi-aquatic mosses growing on the stones. These were—*Fontinalis antipyretica, Rhacomitrium aciculare, Grimmia apocarpa.*

A small box was filled with these, and they were examined later on the same day, on our return to Lochmaddy. Twenty species of organisms were observed, including Rotifers, Tardigrades, Rhizopods, Nematodes, Peridiniaceæ, and Desmids.

List of Species.

Philodina flaviceps (Bryce, M.S.). Abundant.
P. acuticornis, Murray. Few.
P. macrostyla, Ehr. Several.
P. rugosa, Bryce. One.
P. brevipes, Murray. One, very large.
Callidina plicata, Bryce. Few, typical.
C. angusticollis, Murray. One empty case.
C. sp.? Several.
Anuræa cochlearis, Gosse.
Polyarthra platyptera, Ehr.
Diaschiza lacinulata (O. F. Müller).
Metopidia acuminata, Ehr.
Monostyla sp.?
Macrobiotus hufelandi, C. Sch.
Echiniscus arctomys, Ehr., variety.
Euglypha ciliata, Leidy.
Thread-worm sp.
Penium sp.
Closterium sp.
Peridinium tabulatum, Ehr.

Remarks.

Philodina flaviceps was the only abundant species. It is very common at the margins of lakes, all over the Highlands, where it also occurs in streams and rarely in bogs; it has not yet been found outside of Scotland.

Callidina sp. This was one of the pellet-making *Callidinæ*, with a very long neck and a loop formed by the gullet. It is well known and widely distributed on the mainland, and has been thought to be *C. leitgebii*, Zelinka, a species about which there is much doubt.

It was interesting to note the existence of two thoroughly pelagic species of Rotifers, *Anuræa cochlearis* and *Polyarthra platyptera*, which are abundant in nearly every lake in the country, although the largest bodies of water they could find

in St. Kilda were only a few inches deep and less than a foot in diameter.

Monostyla sp. This was the most interesting animal found, and may prove to be a new species. It is a small animal, with flexible lorica, perfectly hyaline, and with a clear, non-pigmented eye. Its most remarkable feature is the very large toe, which is broad, tapering to an acute point, and strongly curved towards the right side, at the same time slightly spirally twisted, so that as it swims the whole animal rotates round its long axis in the manner of a *Mastigocerca.*

Echiniscus arctomys. The form of this extremely variable species found in St. Kilda had the triangular median plates rather more distinct than usual.

The thread-worm and the Desmids could not be specifically named.

ALIEN PLANTS NEAR EDINBURGH.

By James Fraser.

In pursuance of the plan projected in the late autumn of 1902 and begun in 1903 (the results for which year were published in the "Annals" for April last), I have now to record the result of the observations made by Mr James M'Andrew and myself during 1904, on the "alien" flora of the neighbourhood of Edinburgh.

To enable the effect on our Flora caused by the introduction of so many foreign plants to be easily determined at some future time, the definite localities mentioned in my first paper are closely adhered to and represented by the same numbers in the following list.

Thus all plants with the figure 1 attached were found in the same definite, limited area as those with the same figure in my first list; and so on up to No. 5. But near locality No. 1 (which may be called Slateford) are several spots extending from near Slateford Railway Station to Hailes Quarry, where a number of new plants have been found. These are marked 1A.

District No 2. (Granton) has this year produced nothing additional, but near it also several new plants were seen: on

a railway bank (garden outcasts), in nurseries (weeds), and at Warriston (an old record). These are marked 2A.

District No. 3 (the Esk mouth at Musselburgh) likewise yielded nothing new; but by the side of the Esk, from its mouth to the railway bank at Inveresk, several additions were noticed. These are marked 3A.

No. 4 (Murrayfield) yielded only one that has not already been recorded.

No. 5 (Leith Docks) has since last year undergone much alteration, but still remains very productive. *Sisymbrium Irio*, L., and *S. altissimum*, L., have almost disappeared owing to the laying of rails; *Melilotus indica*, All., and *Matricaria discoidea*, DC., are as abundant as ever; *Brassica alba*, Boiss., *Galium tricorne*, Stokes, and *Lolium temulentum*, L., were very abundant; and *Hordeum marinum*, Huds., and *Festuca ligustica*, Bert. were surprisingly plentiful.

No. 6. To these five localities a new one is now added. It consists of Craigmillar Castle and Quarry: in and about the Castle plants still abound which are supposed to have been introduced in the time of Queen Mary; and in the Quarry, partially used as a receptacle for refuse, many garden outcasts are flourishing.

The relative abundance of each species in each locality is again expressed, as kindly suggested by Professor Trail, by the Greek letters placed after the numbers of the localities thus: α = once found; β = twice or thrice, but rare; γ = neither rare nor frequent; δ = frequent; ϵ = abundant; and the † is used to indicate some doubt as to the identity of the species.

RANUNCULACEÆ.

Adonis æstivalis, *L.* 5, β.
Delphinium orientale, *J. Gay.* 5, β.
Helleborus fœtidus, *L.* 2A, α.
Nigella damascena, *L.* 5, β.
Ranunculus falcatus, *L.* 5, α.
R. sardous, *Crantz.* 1, 5, δ.

PAPAVERACEÆ.

Corydalis claviculata, *DC.* 1A, α; Corstorphine Hill, γ.
Eschscholtzia californica, *Cham.* 1, β.
Papaver Lecoqii, *Lamotte.* 5, α.
P. somniferum, *L.* 5, β.

CRUCIFERÆ.

Alyssum campestre, *M. Bieb.* 1, β.
Armoracia rusticana, *Gærtn.* 1, 5, 6, δ.
Barbarea præcox, *R. Br.* 5, β.
Boreava orientalis, *Jaub. and Spach.* 1, β, †.
Brassica elongata, *Ehrh.* 5, β.
B. Napus, *L.* 5, δ.
B. nigra, *Koch.* 1, 5, ε.
B. Tournefortii, *Gouan.* 1, δ.
Bunias orientalis, *L.* 5, 6, α.
Calepina Corvini, *Desv.* 5, α.
Cheiranthus Cheiri, *L.* 2A, β, 6, γ.
Cochlearia officinalis, *L.* variety. 5, α.
Euclidium syriacum, *R. Br.* 5, β.
Hesperis matronalis, *L.* 5, 6, β; Comiston, β.
Lepidium perfoliatum, *L.* 1, 5, δ.
Lunaria annua, *L.* 1A, β.
Matthiola bicornis, *DC.* 1, β.
M. incana, *R. Br.* 1A, α.
Raphanus Landra, *Mor.* Gorgie, δ.
Rapistrum glabrum, *Host.* 1, 5, γ.
Sisymbrium orientale, *L.* 1, 5, β.

RESEDACEÆ.

Reseda lutea, *L.* 1, 5, β.
R. odorata, *L.* 1A, β.

VIOLACEÆ.

Viola odorata, *L.* 2A, β.

CARYOPHYLLEÆ.

Cerastium dichotomum, *L.* 5, β.
Silene Behen, *L.* 1, 5, β.
Silene conoidea, *L.* 1, β,
S. dichotoma, *Ehrh.* 5, γ.

PORTULACEÆ.

Claytonia alsinoides, *Sims.* 2A, α.

MALVACEÆ.

Malva ægyptiaca, *L.* 1A, α, †.
M. parviflora. *L.* 1, 5, β.
M. parviflora, *L.* variety. 5, β.
Malva rotundifolia, *L.* 1, 5, δ.
M. sylvestris, *L.* variety. 5, β.
M. verticillata, *L.* 1, δ.

GERANIACEÆ.

Erodium ciconium, *Willd.* 5, β.
E. moschatum, *L'Herit.* 5, β.
Geranium lucidum, *L.* 6, δ.
Impatiens ——. 1A, 2A, 3A, γ.

LEGUMINOSÆ.

Astragalus hamosus, *L.* 1, β.
Coronilla scorpioides, *Koch.* 1, 5, δ.
Hymenocarpus circinatus, *Savi.* 1, β.
Lathyrus amœnus, *Fenzl.* 1, β.
L. angulatus, *L.* 1, 5, β.
L. blepharicarpus, *Boiss.* 5, β.
L. hirsutus, *L.* 5, β.
L. Ochrus, *DC.* 5, α.
L. sativus, *L.* 1, 5, δ.
L. sphæricus, *Retz.* 1, 5, β.
Lotus edulis, *L.* 5, α.
Medicago falcata, *L.* 2A, 3A, 5, α
M. lupulina, *L. var.* Willdenowiana, *Koch.* 1, 5, α.
M. orbicularis, *Willd.* 1, 5, α.
M. pentacycla, *DC.* 5, β.
M. platycarpa, *Trautv.* 1, α, †.
M. scutellata, *Mill.* 5, α.
M. truncatula, *Gærtn.* 5, β.
Melilotus arvensis, *Wallrh.* 1, 5, ϵ, *
M. messanensis, *All.* 5, α.
M. sulcata, *Desf.* 1, δ; 5, ϵ.
Onobrychis Crista-galli, *L.* 1, 5, β.
O. viciæfolia, *Scop.* 5, α.
Ononis alopecuroides, *L.* 5, β.
Ornithopus compressus, *L.* 1, 6, α.
Phaseolus vulgaris, *L.* 5, γ.
Scorpiurus sulcata, *L.* 1, γ; 5, β.
Securigera Coronilla, *DC.* 5, β.
Trifolium formosum, *D'Urv.* 1, 5, α.
T. fucatum, *Lindl.* 1, β.
T. incarnatum, *L.* Balerno, α.
T. maritimum, *Huds.* 5, β.
T. mutabile, *Portenschl.* 3A, α, †
T. scabrum, *L.* 3, α; 5, β.
T. spumosum, *L.* 1, γ; 5, β.
T. supinum, *L.* 1, 5, β.
T. tomentosum, *L.* 1, 5, β.
Trigonella aurantiaca, *Boiss.* 5, α.
T. corniculata, *L.* 5, β.
T. polycerata, *L.* 5, α.
Vicia angustifolia, *Roth.* variety. 5, β.
V. calcarata, *Desf.* 1, β.
V. melanops, *Sibth.* 5, α.
V. narbonensis, *L.* 1, β.
V. peregrina, *L.* 1, β.
V. dasycarpa, *Ten.* 1, 5, γ.

ROSACEÆ.

Poterium polygamum, *W. and K.* 5, β.
P. Sanguisorba, *L.* 1, 3A, β.
Poterium verrucosum, *Ehrenb.* 5, α.
Spiræa ——. 6, β.

SAXIFRAGACEÆ.

Tellima grandiflora, *R. Br.* 3A, β.

CRASSULACEÆ.

Sedum album, *L.* Blackford Hill, ϵ.

ONAGRACEÆ.

Epilobium nummularifolium, *A. Cunn.* Weed in garden, ϵ.
Œnothera biennis, *L.* 5, α; 6, β.

UMBELLIFERÆ.

Apium graveolens, *L.* 1, 1A, 5, γ.
Bupleurum croceum, *Fenzl.* 1, α.
B. protractum, *Hoff and Lk., var.* heterophyllum, *Link.* 5, γ.
B. rotundifolium, *L.* 1, 5, β.
Carum Petroselinum, *B. and H. f.* 5, γ.
Caucalis tenella, *Del.* 1, β.
Daucus Carota, *L., var.* gummifer, *Lam.* 5, β.
D. Carota, *L.* variety. 1A, α
D. littoralis, *Sibth. and Sm.* 5, α, †.
Heracleum giganteum, *Fisch.* Cramond, δ.
Scandix grandiflora, *De Vis.* 5, β.
Smyrnium Olusatrum, *L.* 6, δ.

RUBIACEÆ.

Asperula orientalis, *Boiss. and Hohen.* 5, δ, †.

VALERIANACEÆ.

Valerianella coronata, *DC.* 5, β.

DIPSACEÆ.

Cephalaria syriaca, *Schrad.* 1, 5, β.
Dipsacus Fullonum, *L.* 1A, α.
Scabiosa prolifera, *L.* 1, 5, β.

COMPOSITÆ.

Achillea Santolina, *L.* 1, β, †
Anaphalis margaritacea, *B. and H. f.* 5, 6, β.
Anthemis altissima, *L.* 1, δ.
Artemisia annua, *L.* 5, β.
A. biennis, *Willd.* 5, β.
Aster ——. 1A, 6, γ.
Calendula arvensis, *L.* 1, 5, β.
C. officinalis, *L.* 1, γ; 5, β.
Carbenia benedicta, *Adans.* 5, β.
Carduus argentatus, *L.* 1, 5, β.
Carthamus tinctorius, *L.* 1, β; 5, α.
Centaurea depressa, *M.B.* 5, β.
C. iberica, *Trev.* 1, α; 5, β.
C. nicæënsis, *All.* 5, β, †.
Chrysanthemum Balsamita, *L.* 1A, β.
Cichorium Endivia, *L.* 4, β.
C. divaricatum, *Willd.* 1, α.
Cladanthus arabicus, *Coss.* 1, β.
Coreopsis tinctoria, *Nutt.* 5, β.
Crepis alpina, *L.* 1, β.
Cynara Scolymus, *L.* 1, 5, β.
Doronicum Pardalianches, *L.* Redford, ε.
Galactites tomentosa, *Mœnch.* 5, β.
Helianthus tuberosus, *L.* 1A, β.
Hieracium aurantiacum, *L.* Manuel, ε.
H. umbellatum, *L.* 5, ε.
Lactuca sativa, *L.* 1, 5, β.
L. virosa, *L.* 5, β.
Matricaria Chamomilla, *L.* 1, 5, β.
Onopordon Acanthium, *L.* 5, α; Fife Coast, α.
Picris hieracioides, *L.* 2A, *.

Rhagadiolus edulis, *Gærtn.* 1, β; 5, δ.
R. Hedypnois, *L. subsp.* R. tubæformis, *Ten.* 1, β.
Sanvitalia procumbens, *Lam.* 5, β.
Scolymus maculatus, *L.* 1, 5, α.
Senecio ægyptius, L. 5, γ.
S. sarracenicus, *L.* Comiston, γ.
Silybum Marianum, *Gærtn.* 1, 5, β.

CAMPANULACEÆ.

Campanula Rapunculus, *L.* Newbattle, γ.

PRIMULACEÆ.

Androsace maxima, *L.* 1, β.
Lysimachia vulgaris, *L.* 5, 6, β.
L. punctata, *L.* 2A, α.

BORAGINEÆ.

Anchusa italica, *Retz.* 1, β.
A. officinalis, *L.* 5, β.
A. sempervirens, *L.* 6, δ.
A. stylosa, *M. Bieb.* 1, β.

CONVOLVULACEÆ.

Cuscuta planiflora, *Ten.* 1, α.*

SOLANACEÆ.

Lycopersicum esculentum, *Mill.* 1A, 1, 2, 5, γ.

POLEMONIACEÆ.

Polemonium cæruleum, *L.* 1A, α.

SCROPHULARINEÆ.

Antirrhinum majus, *L.* 1, 1A, 5, β.
Bartsia Trixago, *L.* 1. α.
Linaria chalepensis, *Mill.* 5, β.
L. purpurea, *Mill.* 6, β.
Mimulus Langsdorfii, *Donn.* Redford, ε; Cramond, δ.
M. moschatus, *Dougl.* 1, α.
Rhinanthus major, *Ehrh.* 5, β.
Veronica peregrina, *L.* 1, β.

LABIATÆ.

Calamintha Acinos, *Clairv.* 5, α.
C. graveolens, *Benth.* 1, α.
Dracocephalum moldavicum, *L.* 1A, α.
Galeopsis Ladanum, *L., var.* latifolia, 5, β.
Lallemantia peltata, *Fisch. and Mey.* 1, 5, β.

Lamium Galeobdolon, *Crantz.* 5, α.
L. maculatum, *L.* Comiston, δ.
Mentha viridis, *L.*, *var.* crispa. 6, β.
Sideritis lanata, *L.* 3A, α.
Stachys annua, *L.* 5, β.
Wiedemannia orientalis, *Fisch. and Mey.* 1, β.

PLANTAGINACEÆ.

Plantago arenaria, *W. and K.* 1, β.
P. lusitanica, *L.* 1, δ; 5, α.
P. ovata, *Forsk.* 1, α.†
P. patagonica, *Jacq.* 2A.*
P. Rugelii, *DC.* 2A.*

CHENOPODIACEÆ.

Chenopodium Bonus-Henricus, *L.* 3A, α; 6, δ.
C. polyspermum, *L.* 1A, α.
C. rubrum, *L.* 5, ε.
C. Vulvaria, *L.* 1, γ; 5, β.
Salsola Soda, *L.* 1A, α; 5, β.
Spinacia oleracea, *L.* 1, 5, β.

POLYGONACEÆ.

Emex spinosum, *Camp.* 5, α.
Polygonum cuspidatum, *S. and Z.* 2A, δ; Redford, ε.
P. lapathifolium, *L.* 1, 5, γ.
P. maritimum, *L.* 1, β.
Rumex bucephalophorus, *L.* 5, α.
R. obtusifolius, *L.*, *var.* Friesii, *G. and G.* 5, β.
R. scutatus, *L.* 6, γ.

URTICACEÆ.

Cannabis sativa, *L.* 5, γ.

LILIACEÆ.

Convallaria majalis, *L.* 2A, β.
Muscari racemosum. *Mill.* 2A, β.

JUNCACEÆ.

Luzula albida, *DC. var.* β, rubella, *Benth.* Redford, γ.

AROIDEÆ.

Arum maculatum, *L.* Bilston Glen, γ.

GRAMINEÆ.

Agropyron triticeum, *J. Gærtn.* 5, β.
Aira capillaris, *Host.* 5, γ.
Apera —— ?. 1, β.
Bromus erectus, *Huds.* 5, β.
B. inermis, *Leys.* Fife Coast, γ.
B. macrostachys, *Desf.* 1, 5, β.
B. madritensis, *L. variety.* 5, γ.

B. scoparius, *L.* 1, 5, *β*.
Elymus sibiricus, *L.* 5, *α*; Kinghorn, *β*.
Festuca ciliata, *Pers.* 5, *α*.
F. Myuros, *L.* 1, *β*; 5, *γ*.
Glyceria procumbens, *Dum.* 5, *α*.
Kœleria phleoides, *Pers.* 5, *β*.*
Lepturus incurvatus, *Trin.* 5, *β*.
Lolium italicum, *Br. var.* muticum. 5, *β*.
Panicum Crus-galli, *L.* 5, *β*.
P. sanguinale, *L.* 5, *α*.
P. —— ?. 5, *β*.
Phalaris arundinacea, *L.*, *var.* picta. Comiston, *β*.
P. paradoxa, *L. var.* (? præmorsa, *Coss. and Dur.*).
Phleum asperum, *Jacq.* 5, *α*.
P. Bœhmeri, *Wibel.* 1, 5, *β*.
P. echinatum, *Host.* 1, *α*.
P. græcum, *Boiss.* 1, 5, *γ*.
P. tenue, *Schrad.* 1, *β*; 5, *γ*.
Poa bulbosa, *L.* 5, *α*.
Schlerochloa dura, *Beauv.* 1, *β*.
Triticum cylindricum, *Ces.* 1, 5, *β*.
T. ovatum, *Rasp.* 1, *α*.
T. speltoides, (*a*) Aucheri, *Aschers. and Grbn.* 5, *α*.*
T. triaristatum, *Gren. and Godr.* 1, 5, *β*.
T. triunciale, *Rasp.* 1, 5, *β*.
T. vulgare, *Vill.* 1, 5, *δ*.

Notes.

Melilotus arvensis, Wallr. (*M. officinalis*, Desr. *and also* Lam.) More careful observation shows this to be the prevailing form in this neighbourhood; *M. altissima*, Thuill. (*M. officinalis*, Willd.) being found only at Hailes Quarry and at St. David's, Fife.

Picris hieracioides, L., *Plantago patagonica*, Jacq., and *P. Rugelii*, DC., were not got wild; they were grown from impurities found in seed of commerce by Messrs. Bell and Bieberstedt, who very kindly permitted me to examine these and many others in their seed-trial grounds at Leith.

Kœleria phleoides, Pers., and *Triticum speltoides* (*a*) *Aucheri*, Aschers. and Grbn. "Syn." ii. 711. For the names of these I am indebted to Professor Hackel, who very kindly added the following synonyms for the latter:—

Ægilops speltoides, "Tausch in Flora," 1837, 108; non Jaub. and Spach.

Triticum speltoides, Godr. "Fl. Massil. Adven." (1857).

Ægilops Aucheri, Boiss., "Diagn." pl. or ser. 1, v. 74 (1844).

Triticum Aucheri, Parl. "Fl. It." i. 508 (1848).

Ægilops macrura, Jaub. and Spach. "Ill. Pl. Or." t. 316 (1850).

Cuscuta planiflora, Ten. (for the name of which I am indebted to Professor Bayley Balfour) was found twining round the stems of *Melilotus indica*, All., *Brachypodium distachyum*, Beauv., and a *Lathyrus*.

Leith, *December* 1904.

NEW AND RARE SCOTTISH MOSSES.

By Dr. James Stirton, F.L.S.

Plagiothecium Kinlayanum (*Strn.*)—The following is a rather more detailed description than that published in 1874:—

In close yet indeterminate patches of a green or yellowish-green colour, or straggling over other mosses; stems mostly procumbent, yellow then reddish, sparingly and irregularly branched, upper branches often the longest, producing stolons also from the upper part, having scattered, minute, slender, pointed leaves; leaves proper laxly disposed around the stem and slightly complanate, very concave, symmetrical, nearly elliptical, with a longish apiculus at the extremity, margin recurved from base up to and including apiculus; breadth of reflexed portion near the middle of leaf as much as ·035 mm., composed of narrower cells, about ·08 by ·008-·011 mm.; containing frequently crowds of minute, well-defined, oval cells, much resembling the minuter stereïds; leaves decurrent, this portion composed of bluntly quadrate, hyaline cells, ·035-·05 by ·025-·035 mm., in two to four perpendicular rows; cells near base oblong, very large, ·08-·11 by ·018-·024 mm., upwards more rhomboid, ·06-·085 by ·015-·02 mm.; nerve broad at base and thickish, single in the lower third, then generally splitting into two unequal branches which proceed upwards for nearly another third of the leaf; primordial utricles seen almost constantly in cells for the upper two-thirds.

Unlike any other *Plagiothecium*, especially when seen in a moist state, inasmuch as the leaves are then hollow and appear scarcely complanate, yet allied to *Pl. sylvaticum* in the shrinking of the dried leaves owing to the very large cells, larger probably than those of any other member of the genus, and in the presence of stolons, which, however, are usually emitted from the upper part of the stems, and not from the axillæ of the branches or leaves. As the longish apiculus to the leaf is dragged back by the uppermost part of the recurved margin, it, too, is recurved, and not unfrequently appears quite uncinate.—Barren.

The best way to ascertain the nature of the recurved margin is to view from behind a thoroughly moistened leaf by means of a lens, when there is seen, all round and just within the margin, a groove, or rather furrow. If this leaf is slightly pressed between two slips of glass and viewed through the microscope, the reflexed margin is seen all round, including the apex; if, however, too much pressure is used, the concave leaf is split in the upper part, and the reflexed margin is undone and appears plane to a corresponding extent.—Ben Wyvis, Ross-shire, A. M'Kinlay, 1867; Ben Sleoch, Loch Maree, Stirton, 1870.

In the neighbourhood of Arisaig and for many miles to the east of it, but more especially on Craig Mohr, from base almost to summit, *Campylopus pyriformis* is very abundant and in places fruits freely. On one or two occasions there was noticed what appeared as a luxuriant state of this moss, with stems frequently of a reddish colour. A microscopical examination of the leaves, and more especially of the nerve, revealed differences of structure of sufficient distinction to warrant a separation from *C. pyriformis*.

Campylopus pergracilis (*n. sp.*)—Densely tufted, of a light-green colour above, paler beneath, half an inch or more in height; stems usually reddish, very slender, simple, or here and there branched; leaves laxly disposed around the stem, erect in a wet or dry state, narrowly lanceolate subulate, very concave, almost tubular above from a somewhat wider base; nerve broad, about three-fifths near base; of a loose, spongy texture throughout, as shown in thin sections; the two anterior rows of cells never less than ·007 to ·008 mm. broad, even near apex, increasing nearly equally downwards to middle, and there about ·014 mm. diameter; lower down the cells of anterior row increasing much more rapidly, so that near base cells of second row as large as ·018 mm., while those of first row often seen from ·026 to ·032 mm. diameter; cells of third row increase from ·003 to ·009 mm.; posterior bulging pellucid cells well seen in upper third or more, ·007 to ·008 mm. diameter, thereafter they soon disappear, to be succeeded in the lower third by the posterior pellucid alternating cells, accordingly the thickness of nerve increases downwards from ·04 to ·06 mm.; stereïds in small groups are seen behind and between cells of second row; central basal cells of pagina, large, oblong, ·075 to ·1 by ·012 to ·015 mm.; outwards narrower, and near margin ·006 mm. broad, all hyaline, upwards cells lessen, but rather suddenly merge into chlorophyllose rhomboid cells, ·015 to ·022 by ·006 to 8 mm., becoming shorter upwards, with, however, a single row of chlorophyllose cells proceeding to apex, or nearly so; leaf serrate on both sides and back for a considerable space down from apex. No auricles. Cells of pagina next nerve at or near base thick, about ·035 mm. antero-posteriorly, but lessen outwardly.—Craig Mohr, Arisaig, 1904.

This might well be called a hybrid between *C. fragilis* and *C. pyriformis*, inasmuch as it has characters peculiar to each. The structure of the nerve resembles that of *C. Hunti* (*Strn.*), and, notwithstanding the slenderness of the leaves, as well as of the whole plant, the anterior cells of the nerve are as large as those of *C. Shawii* or *C. setifolius*, the largest species of the genus.

Ceratodon vialis (*n. sp.*)—In rather compact tufts, from a quarter to half an inch in height, dark-green above, sordid below; stems simple or branching slightly; leaves short, broadly ovate-lanceolate, slightly acuminate, incurved when dry, spreading and

straight when moist, on an average, 1·7 by ·54 mm., margin recurved nearly to apex, and there nearly or quite entire; nerve strong, about ·08 mm. in breadth near base, tapering upwards, soon turning reddish or even red, vanishing just below apex, rarely slightly excurrent; cells of pagina at central base oblong, ·022-·034 by ·014-·02 mm.; shorter outwards, and near margin nearly the same as those above; upper cells bluntly quadrate, showing primordial utricle in almost every instance, large, ·014-·022 mm. across, a very little smaller near apex; perichætial leaves paler, bluntish below, more acute above, clasping closely the seta for a considerable distance; capsule, etc., as in *C. purpureus*, but the cells of the annulus longer—viz., ·06 mm. long, with small roundish red cells at their bases.

This moss is peculiar in the short leaves and large cells of the pagina, nearly four times the area of those of the common form. It bears the same relationship to *C. purpureus* that *Cynodontium laxirete* (Dixon) bears to *C. polycarpum*.—Streets in the suburbs of Glasgow, 1863.

Barbula limosa (*n. sp.*)—Stems rather closely aggregated, forming extensive patches on the bare ground, of a dark-green colour, short, about an eighth to a quarter of an inch in height, simple, so far as observed, with tufts of smooth red radicles at the base; lower half or thereby pale, nearly bare, having only a few minute scattered leaves; upwards the leaves become suddenly compacted into a dense tuft, denser at apex; leaves incurved when dry, spreading and recurved when moist; lower leaves of the tuft short, broadly ovate, upper somewhat longer and narrower, but both roundly obtuse at apex, with the pagina terminating unequally as in *Z. Stirtoni*; nerve pale, then yellow, lastly reddish, narrow, about ·04 mm. broad near base, prominent and smooth behind, tapering upwards and excurrent in a short mucro, at times ceasing below the apiculus; margin plane, often slightly undulating, especially in the upper leaves, slightly crenulated and papillose from projecting cells; cells at base hyaline, exactly as in *B. tortuosa*, oblong, ·04-·05 by ·01-·014 mm. sloping up to a point on the margin, ending abruptly in the dense, opaque cells for the rest of the leaf, ·008-·012 mm. diameter, slightly smaller near apex, densely bigeminately papillose on both aspects of leaf. This moss is allied to *B. inclinata*, but the differences between them are manifest.—Arisaig, near the sea, 1904.

Ulota Scotica (*n. sp.*)—Tufts present much the appearance of those of *U. phyllantha*, but are larger, laxer, light-green above, dark or brownish-black below; stems reddish or red, 1 inch or more long, simple or sparingly branched, arising from a prostrate or creeping stem, emitting here and there from the lower parts of the branches slender stolons, sparingly red-radiculose, bearing scattered minute leaves, shortly nerved or almost nerveless; leaves proper rather laxly disposed, long, narrowly lanceolate, acuminate, nearly erect and

straight when moist, with slightly undulating margins, crisped when dry, margin narrowly recurved, especially on one side, for nearly the lower half; nerve usually red below, narrow, ·045 mm. broad near base, a little broader near middle, then narrowing upwards, prominent behind, ceasing considerably below the acuminated, rather slender apex by as much as ·25 to ·35 mm., leaves of stems bearing propagula, having the nerve proceeding more nearly to the apex; propagula longer than in *U. phyllantha*, mostly with 6 to 7 septa instead of 3 to 5 septa, and dimensions reaching ·14 by ·036 mm., but falling off much more readily; central basal cells long, narrow, ·022-·034 by ·004-·006 mm.; outwards shorter and broader, and near margin oblong, ·014-·018 by ·007 mm.; upwards from oblong becoming rounded, with clear spaces between, ·008-·012 diameter; no basal marginal row of pellucid cells as in *B. phyllantha*. The cells of this species are accordingly larger than those of the other, and more strongly papillose on both sides, papillæ generally bi-geminate; base of leaf and nerve red.—Near Arisaig, on branches of trees.

Isothecium persimile.—Similar to *Is. myurum* as regards ramification, etc., but smaller, while the stolons issue, for much the greater part, from the tips of the branches, or rather seem a continuation of them, a few, however, are seen beneath; both stem and branch leaves bipartito-imbricated, secund or deflexed, oval or nearly elliptical, symmetrical, nerveless, concave especially transversely, margin plane throughout, slightly serrulate above and convex in outline, apex bluntish; cells in centre of leaf, narrowly linear with blunt extremities, separate and distinct, ·03-·04 by ·003-·004 mm., outwards a little broader in all directions, especially towards margins, where there is often a marginal row of narrowly oval cells, ·013-·017 by ·005 mm.; at alar base a largish group of obtusely quadrate, yellow or reddish, opaque and granular cells, ·01-·016 mm. diameter, in four or five perpendicular rows; branch leaves narrower than, but nearly of the same shape as, the stem leaves, and alar spaces smaller with cells not so deeply coloured, often only yellowish.—Ben Sleoch, Loch Maree, 1870.

There is only one oval capsule with yellow outer teeth, set nearly straight on a strong, smooth, red seta. I refrain from saying more, as the seta is detached from the perichætium.

Besides those described several rare or comparatively rare mosses were secured in the neighbourhood of Arisaig, during July and August 1904. *Gymnostomum calcareum*, *Dicranella curvata* (Hedw.), *Campylopus Shawii* (Wils.) the last in one patch only; and although I searched diligently for several days, as well as at various times during my stay in the district, I failed to alight upon any more. The nearest station for this moss to the present one is on the east

side of Blavin in Skye, a distance of fourteen to sixteen miles. Through what means the minute buds, detached from this moss (the only method of propagation hitherto known), could have been carried across nine or ten miles of sea is a nice question. This tuft is the only one yet discovered on the mainland of Scotland. *Campylopus subulatus* (Sch.) in two places with stems from a quarter to half an inch long; *C. symplectus* (Strn.); *C. purpurascens* (Strn.). The last three are easily distinguished in the field, almost at sight, and they present *inter alia* a curious gradation of the size of the cells near the base of the anterior row in the nerve. In the first, these cells vary from ·01 to ·014 mm. diam.; in the second from ·013 to ·018 mm.; in the third from ·016 to ·027 mm.; *C. Hunti* (Strn.); *C. fulvoviridis* (Strn.). *C. atrovirens* (De Not.), var. *incurvatus* (Strn.), is not uncommon throughout the West of Scotland. *C. brevipilus* (B. & S.) is rather rare, but a variety with abundance of red tomentum in the lower half was found in several localities. This may be called var. *rutilescens*. Lastly, a curious state of *Bryum alpinum*, with the peculiar colour of, as well as with leaves slightly incurved at the apex as in *Br. Mühlenbeckii*, but with areolation distinctly that of *Br. alpinum*. *Ceratodon conicus*, *Hyp. Cristacastrensis*, and *Hylocomium umbratum* were also seen.

GLASGOW, 17*th November* 1904.

ADDITIONS TO CENSUS OF SCOTTISH HEPATICÆ, 1904.

By SYMERS M. MACVICAR.

I HAVE examined specimens of the following additions to the Census since January 1904. They number 368, most having been found last year, but a considerable number were collected in previous years. The additional species for Scotland, which are also additions to the British Isles, are *Nardia Breidleri*, *Lophozia guttulata*, *Odontoschisma Macounii*, *Kantia sphagnicola*, and *Scapania paludosa*. *Marsupella Pearsoni* and *Cephaloziella Jackii* are additions to Scotland. *Marsupella sphacelata* is an addition to the Census, as I had not at the time seen a Scottish specimen.

The vice-counties from which the fewest species have been recorded are, Selkirk, Roxburgh, Berwick, Haddington, North Aberdeen, Banff, Elgin, and Orkney.

72. Dumfries.

Cephalozia connivens
Cephaloziella stellulifera
C. Jackii
Radula complanata
Madotheca rivularis
} *Miss K. B. Macvicar.*

Lophozia barbata
Scapania curta
} *P. Ewing.*

Lophozia alpestris, *J. M'Andrew.*

74. Wigtown.

(*P. Ewing.*)

Conocephalum conicum.
Preissia quadrata.
Metzgeria conjugata.
Pellia epiphylla.
Marsupella emarginata.
M. aquatica.
Nardia obovata.
Sphenolobus exsectæformis.
Lophocolea bidentata,
Chiloscyphus polyanthos.
Cephalozia Lammersiana.
C. leucantha.
Cephaloziella divaricata.
C. stellulifera.
Kantia trichomanis.
K. Sprengelii.
Scapania compacta.
S. gracilis.
S. purpurascens.
S. undulata.
S. irrigua.
S. curta.
Radula complanata.
Anthoceros lævis.

75. Ayr.

(All *C. Scott*, except *Preissia.*)

Aneura multifida.
Fossombronia pusilla.
Lophozia incisa.
Mylia anomala.
Odontoschisma Sphagni.
Kantia trichomanis.
Lepidozia trichoclados.
Preissia quadrata, *J. M'Andrew.*

76. Renfrew.

Riccia glauca
Scapania gracilis
} *P. Ewing.*

Saccogyna viticulosa, *W. Campbell.*

(*C. Scott.*)

Metzgeria hamata.
Pellia endiviæfolia.
Marsupella aquatica.
Lophozia Mülleri.
L. incisa.
Lophocolea heterophylla.
Cephalozia curvifolia.
Bazzania triangularis.
Ptilidium ciliare.
Trichocolea tomentella.
Scapania undulata.
Radula Lindbergii.
Madotheca platyphylla.
M. rivularis.
Anthoceros lævis.

77. Lanark.

Riccia sorocarpa, Lophozia inflata, Mylia anomala — *P. Ewing.*

Lophocolea heterophylla, *W. Evans.*

78. Peebles.

(*W. Evans.*)

Pellia endiviæfolia
Aplozia crenulata
Lophozia turbinata

79. Selkirk.

Cephaloziella stellulifera, *W. Evans.*

81. Berwick.

Fossombronia pusilla, *W. Evans.*

82. Haddington.

Preissia quadrata, *W. Evans.*

83. Edinburgh.

Lophozia inflata, *var.* heterostipa
Cephalozia pallida
Trichocolea tomentella
— *W. Evans.*
Cephalozia leucantha, *P. Ewing.*

84. Linlithgow.

Aplozia crenulata, *var.* gracillima, *C. Scott.*
Scapania gracilis, *W. Evans.*

85. Fife.

Pallavicinia Flotowiana, Frullania fragilifolia — *W. Smith*

Trichocolea tomentella, *W. R. Thomson.*
Lejeunea patens, *W. Young.*

(*W. Evans.*)

Blasia pusilla.
Aplozia pumila,
Lophozia Mülleri.
L. incisa.
L. gracilis.
Anastrepta orcadensis.
Lepidozia trichoclados.
Scapania æquiloba.
S. intermedia.
S. undulata.
S. irrigua.
S. curta.

86. Stirling.

Lophozia barbata, Scapania nemorosa — *W. Evans.*

Aplozia autumnalis, Lophozia gracilis — *J. M'Andrew.*

(*S. M. Macvicar.*)

Aneura multifida.
Marsupella Funckii.
Aplozia crenulata, *var.* gracillima.
A. pumila.
Sphenolobus exsectus.
Plagiochila punctata.
Hygrobiella laxifolia.
Cephaloziella divaricata.
Kantia arguta.
Scapania subalpina.
S. undulata.
Radula aquilegia.
R. Lindbergii.
Colurolejeunea calyptrifolia.
Cololejeunea microscopica.
Drepanolejeunea hamatifolia.
Harpalejeunea ovata.
Frullania microphylla.
F. fragilifolia.

87. West Perth.

(*W. Evans.*)

Scapania æquiloba.
S. aspera.
S. irrigua.
S. rosacea.

88 Mid Perth.

Lophozia longidens
Odontoschisma Macounii } *P. Ewing.*
Riccia bifurca, confirmed, *T. Barker.*
Scapania paludosa, *B. Carrington.*
Cephalozia Lammersiana, *C. Scott.*
Marsupella Sprucei, *S. M. Macvicar.*

89 East Perth.

Metzgeria conjugata
Lophocolea cuspidata } *C. M'Intosh.*
Trichocolea tomentella
Pellia endiviæfolia, *R. H. Meldrum.*
Gymnomitrium corallioides, *E. M. Holmes*
Lophozia inflata, *var.* heterostipa, *G. Stabler.*
Radula Lindbergii, *T. Barker.*

(*J. Fergusson.*)

Aneura multifida.
Pellia Neesiana.
Gymnomitrium adustum, *var.* olivacea.
Marsupella Funckii.
Nardia minor.
Cephalozia pleniceps.
Cephaloziella divaricata.
Lepidozia trichoclados.
Anthelia Juratzkana.
Scapania nemorosa.
S. irrigua.
S. curta.
Lejeunea patens.

(*P. Ewing* and *W. Young.*)

Nardia obovata.
Aplozia crenulata, *var.* gracillima.
A. pumila.
Lophozia bicrenata.
L. socia.
Sphenolobus exsectæformis.
Harpanthus Flotowianus.
Cephalozia connivens.
Cephaloziella Jackii.
Odontoschisma Sphagni.
Pleuroclada albescens.

90 Forfar.

Gymnomitrium crenulatum
G. varians
Lophozia alpestris, *var.* gelida
Harpanthus Flotowianus
Scapania uliginosa
} *P. Ewing* and *W. Young.*

Fossombronia pusilla, *J. Fulton.*
Nardia compressa, *J. Whitehead.*
Pleuroclada albescens, *W. W. Evans.*
Madotheca lævigata, *W. Gardiner.*

(*J. Aimer.*)

Riccia Lescuriana.
Reboulia hemisphærica.
Lunularia cruciata.
Lophocolea heterophylla.
Plagiochila spinulosa.
Cephalozia connivens.
C. lunulæfolia.
Scapania intermedia.

(*J. Fergusson.*)

Aneura pinguis.
Pallavicinia Blyttii.
Fossombronia Wondraczekii.
Gymnomitrium concinnatum.
Marsupella ustulata.
M. Funckii.
Nardia minor.
Aplozia autumnalis.
A. sphærocarpa.
Lophozia inflata *var.* heterostipa.
Sphenolobus exsectæformis.
Cephalozia pleniceps.
C. reclusa.
Lepidozia trichoclados.
Anthelia Juratzkana.
Diplophyllum taxifolium.
Scapania paludosa.
S. umbrosa.
Lejeunea patens.
Anthoceros punctatus.

92. South Aberdeen.

Lophozia guttulata
Sphenolobus exsectæformis
} *G. Stabler.*

Marsupella sphacelata, *J. Whitehead.*
Lophozia Wenzelii, *W. West.*
Scapania paludosa, *A. Croall.*

Marsupella Sprucei
Lophozia inflata, *var.* heterostipa
Pleuroclada albescens
Anthelia Juratzkana
} *P. Ewing* and *W. Young.*

93. North Aberdeen.

Metzgeria furcata
Cephalozia bicuspidata
Radula complanata
Frullania Tamarisci
} *J. Fergusson.*

Metzgeria pubescens
Plagiochila asplenioides
Madotheca rivularis
} *J. M'Andrew.*

95. Elgin.

Lophozia gracilis, *Miss K. B. Macvicar.*

96. East Inverness.

(*Miss K. B. Macvicar.*)

Aneura palmata.
Fossombronia Dumortieri.
Cephalozia lunulæfolia.
C. leucantha.
C. curvifolia.
Odontoschisma Sphagni.
Kantia sphagnicola.
Scapania umbrosa.

(*Ll. J. Cocks.*)

Metzgeria pubescens.
Pallavicinia Blyttii.
Gymnomitrium varians.
Marsupella erythrorhiza.
M. aquatica.
Nardia compressa.
Aplozia sphærocarpa.
Plagiochila spinulosa.
Scapania nimbosa.

97. West Inverness.

Aplozia cordifolia, *J. Whitehead.*

(*S. M. Macvicar.*)

Marsupella erythrorhiza.
Nardia Breidleri.
Lophozia inflata *var.* heterostipa.
Sphenolobus Kunzeanus.
Cephaloziella stellulifera.
Anthelia Juratzkana.

98. Argyll.

(*S. M. Macvicar.*)

Aneura palmata.
Marsupella ustulata.
M. Sprucei.
Lophozia inflata *var.* heterostipa.
L. bicrenata.
Cephalozia connivens.
Scapania uliginosa.
S. umbrosa.

(*Ewing* and *Macvicar.*)

Sphenolobus politus.
Eremonotus myriocarpus.
Marsupella Pearsoni, *C. Scott.*
Anthelia Juratzkana.

99. Dumbarton.

Lophozia inflata
L. barbata
Cephalozia lunulæfolia } *W. Campbell.*
C. curvifolia
Cololejeunea calcarea } *C. Scott.*
Lunularia cruciata, *Miss Macvicar.*
Marsupella aquatica
Sphenolobus exsectus } *S. M. Macvicar.*
Scapania umbrosa

100. Clyde Isles.

Scapania compacta, *P. Ewing.*

(*W. Campbell.*)

Aneura multifida.
Metzgeria hamata.
Nardia obovata.
Mylia Taylori.
Pleurozia purpurea.

(*S. M. Macvicar.*)

Reboulia hemisphærica.
Preissia quadrata.
Aneura pinguis.
A. latifrons.
Pellia endiviæfolia.
Gymnomitrium concinnatum.
G. crenulatum.
Marsupella Funckii.
M. emarginata.
Aplozia crenulata, *var.* gracillima.
A. pumila.
Lophozia incisa.
L. Lyoni.
Plagiochila punctata.
Mylia anomala.
Lophocolea cuspidata.
L. spicata.
Harpanthus scutatus.
Cephalozia connivens.
C. Francisci.
Hygrobiella laxifolia.
Odontoschisma Sphagni.
Adelanthus decipiens.
Bazzania trilobata.
Lepidozia pinnata.
L. Pearsoni.
L. trichoclados.
L. setacea.
Blepharostoma trichophyllum.
Ptilidium ciliare
Scapania umbrosa.
Radula aquilegia.
R. complanata.
R. Lindbergii.
Cololejeunea microscopica.
Harpalejeunea ovata.
Frullania fragilifolia.
Cephalozia leucantha.
Scapania aspera.
S. curta.

101. Cantyre.

(*P. Ewing.*)

Marsupella Funckii.
Cephalozia curvifolia.
Lepidozia Pearsoni.
Herberta adunca.
Pleurozia purpurea.

102. South Ebudes.

Scapania compacta } *P. Ewing.*
S. curta }

Cephaloziella divaricata, *Miss Evans.*

104. North Ebudes.

(*Miss K. B. Macvicar.*)

Nardia compressa.
N. minor.
Lophozia inflata.
Scapania subalpina.

105. West Ross.

(*Miss K. B. Macvicar.*)

Nardia minor.
Lophocolea heterophylla.
Anthoceros punctatus.

106. East Ross.

(*T. Barker.*)

Metzgeria conjugata.
Marsupella aquatica.
Cephalozia curvifolia.
Trichocolea tomentella.
Scapania paludosa.

(*Ll. J. Cocks.*)

Pallavicinia Blyttii.
Gymnomitrium concinnatum.
Lophozia lycopodioides.
Anastrophyllum Donianum.
Anastrepta orcadensis.
Diplophyllum taxifolium.
Harpanthus Flotowianus.
Pleuroclada albescens.
Scapania ornithopodioides.

107. East Sutherland.

(*D. Lillie.*)

Conocephalum conicum.
Preissia quadrata.
Aneura multifida.
Metzgeria furcata.
Aplozia crenulata.
var. gracillima.
A. sphærocarpa.
A. riparia.
Lophozia turbinata.
L. Lyoni.
Lophocolea bidentata.
L. cuspidata.
Chiloscyphus polyanthos.
Cephaloziella stellulifera.
Ptilidium ciliare.
Scapania compacta.
S. subalpina.
S. gracilis.
S. irrigua.
Radula complanata.
Frullania fragilifolia.
F. dilatata.

108. West Sutherland.

Lophozia gracilis, *D. Lillie.*
Diplophyllum ovatum, *D. Lillie.*

109. Caithness.

(*D. Lillie.*)

Gymnomitrium crenulatum.
Lophozia incisa.
L. bicrenata.
L. alpestris.
var. gelida.
Chandonanthus setiformis.
Anthelia Jurakzkana.
Ptilidium ciliare.
Diplophyllum ovatum.
Scapania compacta.

110. Outer Hebrides.

Lophozia alpestris, *var.* gelida } *W. West.*
Cephaloziella divaricata }
Preissia quadrata } *P. Ewing.*
Lophozia Floerkii }

112. Shetland.

Gymnomitrium concinnatum, *W. H. Beeby.*
Odontoschisma denudatum, *W. West.*

Invermoidart, *February*, 1905.

ZOOLOGICAL NOTES.

Common Shrew in Islay.—Last year I sent some young friends of mine who were spending their holidays in Islay a few traps to catch small mammals with, and in September they sent me a Shrew from the island. On examination it proved to be referable to *Sorex araneus* and not to *S. minutus*, which until quite recently was supposed to be alone present in the Hebrides. There is a record of the Common Shrew from Mull in the "Annals" for 1904, p. 186.—William Evans, Edinburgh.

Lesser or Pygmy Shrew in Argyll.—In your issue for January last I reported the occurrence of the Water Shrew in this area. I have now to record the Lesser or Pygmy Shrew (*Sorex minutus*), several specimens of which I have caught and identified. As we have also the Common Shrew, all the three species of Soricidæ are represented here.—Chas. H. Alston, Letterawe, Loch Awe.

The Affinities of the Orkney Vole.—In a communication to the "Annals and Magazine of Natural History" for March (pp. 323-324), Dr. Forsyth Major expresses his views on the affinities of the Orkney Vole (*Microtus orcadensis*). These opinions, backed as they are by eminent special knowledge, are of exceptional value and interest and may be regarded as finally settling an important

question. Dr. Forsyth Major tells us that in its external characters, as well as in the character of its teeth, it is a member of the same subgenus as the Field Vole (*M. agrestis*), and that the peculiarities of the skull by no means contradict this statement. It is to *M. arvalis* and its allies, one of the Field Voles of Continental Europe and Northern Asia, which the Orkney Vole approaches most in the characters of the skull. The teeth of the Orkney species being, moreover, indistinguishable from those of the *M. arvalis* group, place should be assigned to it within the latter, of which it is a large-sized and otherwise remarkable form, well deserving of a specific name of its own.

Dr. Forsyth Major concludes his communication with the following important remarks, "one form (possibly more) of a vole with teeth of the *M. arvalis* type is represented by jaws in some of our caves and river deposits. Not having as yet come upon fairly complete skulls, I do not venture to assert that the species *M. arvalis* was represented in Great Britain during Pleistocene times; but the *M. arvalis group* certainly was. This last circumstance will in due time presumably help to explain satisfactorily the present existence of a member of the *M. arvalis* group in the Orkney and Shetland[1] Islands."

Notes from North Shetland.—Stock Dove—*Columba œnas.*—One at Halligarth on June 22nd, 23rd, 24th, and 25th. I saw the bird many times each day—lying in wait for it so as to be sure of its identity. One has to be very careful about the identity of birds described as "Stock-pigeon" or "Stock-doo" by Shetlanders, the word "stock" is used by many natives to describe large or common species.

Linnet.—*Linota connabina.*—One at Halligarth. This bird is very rare in Shetland. I think Mr. Harvie-Brown was the first to identify it a few years ago.

Great Northern Diver.—*Colymbus glacialis.*—This species has been very numerous since autumn. In fresh specimens (of which unfortunately I have had opportunities of examining a great many) the bill, usually described as "horn colour" has not been so. Towards the end of the upper mandible certainly this colour prevails, but as regards the rest it has always in my experience been of a more or less bluish-white, changing rapidly to reddish-purple and then to dull horn colour. The inside of the tarsi and toes, and also

[1] Although Mr. Millais includes the "Shetlands" in the habitat of this species in his great work on British Mammals (vol. i. p. 8), he has not been able to obtain positive proof of its existence in the islands, and desires the statement made in the last number of the "Annals" (p. 1) to be modified. He says that he is almost certain that it existed there until recently, and that he does not yet despair that he will obtain Shetland examples, but that we are mistaken in our supposition that he had secured specimens.—Eds.

the middle portion of the webs, are also bluish-white, very much the same as in the case of the Long-tailed Duck; this white colour soon changes to brownish-black.

Whooper Swan.—*Cygnus musicus.*—Heard passing overhead, on 8th November, at 8 p.m.

Woodcock.—*Scolopax rusticula.*—A few seen during the snowy weather in December.

Snowy Owl.—*Nyctea scandiaca.*—One at Balliasta on 29th November.

Great Snipe.—*Gallinago major.*—In the "Annals" for 1902, p. 34, a Great Snipe is recorded for these islands, and the specimen regarded as the first actual occurrence of this species for Shetland. May I draw attention to the fact that my father undoubtedly secured several examples, as must be manifest to all who consult his "Birds of Shetland," (pp. 200-201).—T. Edmondston Saxby, Halligarth, Baltasound, Shetland.

Brambling in the Isle of Mull.—The visits of the Brambling (*Fringilla montifringilla*) to the West Coast are sufficiently rare, so that it may be well to record an incursion of this species. On the 22nd of November, in Aros woods, I observed a single bird beneath a beech tree and accompanied by chaffinches (*Fringilla cœlebs*), and also on following day near the same spot. Others were seen by the gardener to Mr. Allan of Aros, who knew the bird, having seen them at the time of a large invasion about ten years ago, when several were caught.—D. Macdonald, Tobermory.

Movements of Wood-pigeons into Easter Ross.—December 13, 1904, was the fifth day on which the ground had been covered with snow, and there was a strong gale blowing from the N.W. off the land. Thinking that we might see some bird-life in the Cromarty Firth in the calm water close to land, I, along with a friend, went down to the shore below Tarbet woods, Kildary, to where the Balnagowan river joins the sea. As soon as we got within sight of the Firth we observed a small party of Wood-pigeons (*Columba palumbus*) flying low over the Firth from the direction of Cromarty. The light was beginning to go, but for quite half an hour—till dark—they kept arriving in lots ranging from about one to thirty. Some came from Cromarty direction, some from the direction of the Northern Sutor, and others from points between, flying in the teeth of the gale. There must have been many thousands of them, all flying from the S.E. My first thought was that this was a partial migration of pigeons, perhaps from Morayshire. On mentioning this to my friend Mr. J. A. Forsyth, he suggested that as the slope of the N. Sutor, which faced the sun, had been the first bit of ground to thaw, the birds from Balnagowan and Tarbet woods, where there are always large numbers, had

flocked thither to feed. The wind, of course, would account for the difference in the directions from which they came. This is very likely the true explanation, though, if it is, I had no idea that so many birds spent the winter in the woods named. We have immense flocks here in the autumn, which feed on the standing grain, stubble, and the turnip drills. On the approach of winter, however, the majority of them seem to disappear. I questioned the Tarbet keeper afterwards, but he had not noticed the birds. We shot a few of them, and they proved to be fine big birds and bright in the plumage.—Ewen Kennedy, Delny.

Albino Redshank and Rock Pipit in Barra, Outer Hebrides.—On the 23rd of October last I saw an albinistic Redshank (*Totanus calidris*) here. This was afterwards obtained, and a short description of its plumage may be worth recording:—Primaries white towards the tips and shading into cinnamon brown at their bases; secondaries white; primary coverts cinnamon; a few of the secondary coverts brown, the rest white; head and upper neck pale cinnamon brown, marked with lighter brown and white; back and under surface white, very faintly marked with pale brown; tail and its coverts white, barred with light brown.

An albino Rock Pipit (*Anthus obscurus*) was shot on the 1st of September.—Wm. L. MacGillivray, Barra.

Black Tern and other Birds in "Forth."—On the 7th of September last a young Black Tern (*Hydrochelidon nigra*), ♀, which I examined shortly afterwards, was shot by a keeper at Gladhouse Reservoir, adjoining the Moorfoot Hills, Midlothian. It was alone, and was "catching flies like a swallow." Another, in very poor condition, was shot by W. Renton at Gullane Point, on the coast of East Lothian, on the 26th of November.

On the 20th of January this year, a Little Gull (*Larus minutus*) was shot near Dunbar Harbour and taken to Mr. D. Bruce, who kindly informed me of the occurrence, so that I had an opportunity of seeing the bird—an immature female—in the taxadermist's hands. When at North Berwick in December, I was told that one had been seen off that town.

A few Little Auks (*Mergulus alle*) also made their appearance in the Firth of Forth this winter. One was caught at Dunbar on the 27th of November, and another, which was entangled in a herring net on the fishing grounds at the mouth of the Firth, was taken to Mr. Bruce on the 22nd of February. On the 14th of January I had the pleasure of watching one for some time myself to the east of the Forth Bridge. The North Berwick fishermen reported them as being in small numbers—single birds or at most two or three together—between there and the Isle of May during November, December, and January.—William Evans, Edinburgh.

Green Sandpiper in Renfrewshire.—On the 11th of December 1904 I observed a Green Sandpiper (*Totanus ochropus*) on the banks of an old clay hole pond at Hangingshaw, just within the south-eastern boundary of the City of Glasgow. It was hard frost at the time and the bird remained there all day, but was gone by the next morning, when the frost had also disappeared. In flight the white rump and upper tail coverts contrasted strongly with the dark-coloured back. This species has occurred before in Renfrewshire, one having been shot and another seen in its company at Pollok on the Cart on the 10th of November 1868. (Gray, "Birds of the West of Scotland," p. 293).—Robert and H. W. Wilson, Glasgow.

Sturgeon in the Shetland Seas.—Some little time ago a strange fish was found on the shore at the Island of Trondra, near Scalloway. Unfortunately it was cut up by the finder and cast upon a refuse heap; but the Fishery Officer heard about it and rescued some of its scales and sent them to Dr. Scott, of the Fishery Board, who identified them as those of a Sturgeon (*Acipenser sturio*). The only previous reference relating to the occurrence of this fish in the Shetland Seas is contained in Edmondston's "View of the Zetland Islands" (ii. p. 305), wherein it is stated: "Tradition says that this fish has been seen in Zetland, but I question much the accuracy of the assertion." Thus this appears to be the first authentic record of the occurrence of this singular fish in Shetland waters.—John S. Tulloch, Lerwick.

Spiders from the Flannan Isles.—Mr. Eagle Clarke has handed me, for identification, two spiders he captured on the Flannan Isles, Outer Hebrides, in September last. They are: *Trochosa terricola*, Thor. (an ad. ♀), and *Drassus troglodytes*, C.L.K. (a ♂). The former species is common and very widely distributed in Scotland; among the northern localities from which it has been recorded are Aviemore, Sutherland, and Orkney. The Drassid is apparently less common, and has not previously been recorded from further north than Aberdeen, Aviemore, and Oban. In view of the outlying position of the Flannans, these records are of much interest.—William Evans, Edinburgh.

Spiders from "Upper Forth."—During the last five years I have taken the following spiders in the upper portion of the Forth area. They are all additions to the "Upper Forth" list given in a paper by Prof. Carpenter and myself in the "Annals" for 1897; and some of them are also additions to my Perthshire list in "Transactions Perthshire Soc. Nat. Sc.," 1900. Specimens have been submitted to Rev. O. P. Cambridge for authentication.

Hahnia nava (Bl.).—Aberfoyle, July 1900, ad. ♀.

Asagena phalerata (Panz.).—Adults, especially males, common on a sunny bank at Balquhidder, August 1902.

Tmeticus montigena (L.K.).—On the 25th of September 1902 I met with several ad. ♂s and ♀s of this mountain species under stones at an elevation of 3500 ft. on Am Binnein, well on the "Forth" side of the watershed. A ♀ was also found on 13th September on the summit of Ben Voirlich in the "Tay" area.

Erigone promiscua (Cb.).—Callander, April 1900, ♂.

Walckenäera nudipalpis (Westr.).—Callander, April 1900, ♀.

Tetragnatha solandrii, Scop.—One on a gate about two miles east of Callander, April 1900.

Xysticus erraticus (Bl.).—Balquhidder, August 1902, ♂.

Trochosa cinerea (F.).—In August 1902 this, the largest of our "Wolf" spiders, was common on shingle at the head of Loch Doine, Balquhidder.

Epiblemum cingulatum (Panz.).—Near Callander, April 1900, ♂.

The specimen recorded in the above-mentioned lists as *Diplocephalus* (*Plæsiocrærus*) *alpinus* (Cb.) is, it now appears, not that form, but *D. latifrons* (Cb.).—William Evans, Edinburgh.

Japanese Larch v. Hares and Rabbits.—The culture of the Japanese Larch (*Larix leptolepis*) has now become sufficiently advanced to show beyond doubt that it is twice, or thrice, quicker in growth than the European variety, or rather "true native," as nurserymen and foresters are so particularly fond of terming the home produce. Whether the matured timber will not be correspondingly softer remains to be seen, and whether the far-eastern tree will emerge successfully from a life encounter with the vagaries and vicissitudes of our variable climate the future will show. That it is not to be exempt from the tortures of the Larch disease, as was fondly hoped, has been proven by Dr. A. Henry of Kew, who has detected this attack in both Perthshire and Dumfriesshire. I have also seen the disease from the latter county, but I have a strong belief that the disease attack on the Japanese trees will never be so virulent as it has been on the natives. My present purpose, however, is to point out a remarkable preference shown by hares and rabbits for the Japanese Larch, both in nurseries and in the plantations. We are all wofully familiar with the ravages of that "unholy beast," the rabbit, when he manages to get admission, either by the carelessness of those in charge of the woods, or the confiding indifference of the game interests, to the enclosures where young trees have been recently planted. Hares also do much damage, but their nibbling is usually of a discriminating kind, taking a top here and there when they find a shoot that suits their taste. But if they get admittance to newly-planted Japanese Larch they go for all and sundry, eagerly taking every plant and eating it down to the ground. Lately I have seen plantations where the hares had picked out every Jap. and left the native severely alone. Rabbits show the same preference, but not in so marked a degree. To our own

senses the Japanese Larch shows a very much stronger odour, and this is especially the case when one passes a nursery break of this tree on a hot, steamy, summer day. This preference, of hares especially, for the tree is a point of some little natural history interest, although, in view of the efforts nurserymen have been making to induce planters to grow the species extensively, it is hardly one that a member of the craft ought to unduly emphasize! —ROBERT SERVICE.

BOTANICAL NOTES AND NEWS.

Potamogeton falcatus, *Fryer*, in Scotland.—This plant was described and figured by Mr. A. Fryer in the "Journal of Botany," t. 286, p. 65, 1889. I have a specimen from Ardblair Loch, E. Perth (Co. 89) August 1881, collected by the late Mr. A. Sturrock. This matches specimens gathered by Mr. Fryer at Stocking Fen, Ramsey, Huntingdonshire. Various opinions were given on this plant by Mr. Fryer's correspondents in Britain, by Dr. Morong in N. America, and by Dr. Fischer in Europe. It comes nearest to *P. nitens*, Weber; but fruits freely, and in its early spring and autumnal states differs from that.

Ascherson and Graebner ("Synop. der Mitteleurop. Flora," i. 326, 1897), put *falcatus* under *P. gramineus*, L., var. *P. heterophyllus*, Schreb. × *nitens*, Weber, citing "*P. graminea* × *perfoliata*, A. × *graminea* (*i.e.* a double hybrid), (*P. innominatus*, Tiselius, *herb.*)" for their plant, with a reference to Almquist.

Now Dr. Tiselius's plant may be a hybrid between *heterophyllus* and a large form of *P. nitens* (like var. *latifolius*, Tis., *non* Fieber). In this Mr. Fryer agrees so far as it refers to two specimens in my herbarium, but the third one he unhesitatingly refers to *P. coriaceus*, Nolte. But to associate Mr. Fryer's plant with this seems to me difficult, if not impossible. I see no actual similarity in a large series of *falcatus* to this *innominatus* of Tiselius; who still further complicates the case by writing on his labels "Ad *P. nigrescentem*, Fries, accedens." In this I cannot agree, as Lestadius' original specimens, described by Fries, are a form of *P. alpinus* Balb. (*P. rufescens*, Schrad.): of this I possess an example.

Another difficulty suggests itself; if *P. nitens*, Web., is "absolutely sterile" how does it cross with other species? Perhaps occasionally (though rarely), on hybrids usually sterile, mature fruits are found.

Ascherson and Graebner may have been misled by the plate of *P. falcatus*, which, though admirably representing the form figured, hardly gives a good idea of the plant as a series of specimens represents it.

Scotch botanists should look for this *falcatus*. It may be said to resemble *nitens* and *heterophyllus* in habit, but with the barren branches more like some small form of *alpinus*.—ARTHUR BENNETT.

Pyrus Aria, *Ehrh.*—Does this occur anywhere in Scotland under conditions that would give reason to regard it as indigenous. It is common by roads and in pleasure grounds, where it has evidently been planted; and it is also not uncommon in woods in the lowlands, but, so far as I have seen it, only where it might readily have sprung from seeds carried by birds from planted trees. It may be mentioned that in N.E. Scotland it is usually called "Mulberry," the name "White Beam" never being used. It frequently grows along with the Rowan or Mountain Ash (*P. Aucuparia*); and an evident hybrid (*P. pinnatifida*, Ehrh.) occasionally accompanies the parent species. What extremes of height of girth and of stem at say five feet from the soil, have been observed in Scotland?—JAMES W. H. TRAIL.

Bladderworts (Utricularia) in Scotland.—Although Bladderworts can scarcely be called common plants in Scotland they are plentiful in a good many pools and swamps, and probably are more frequent than might be supposed from their recorded distribution. They are readily overlooked, owing to their growing under water, often concealed among larger plants or by floating algæ. They appear to flower very irregularly, years passing without a trace of flowers; but occasionally numerous plants flower simultaneously. Though *U. vulgaris* and *U. minor* are met with in fair amount in several places near Aberdeen, and are seen by me every summer rather frequently, and *U. intermedia* is occasionally observed also, though much more local, I cannot recall finding flowers in more than three, or possibly four, out of over thirty years' observation of these plants in N.E. Scotland. Do they flower more frequently in other parts of the country. The Bladderworts require careful scrutiny, as the species are hard to identify in absence of flowers, and their distribution in Scotland is in great need of careful revision with adequate material.—JAMES W. H. TRAIL.

Corrections.—Unfortunately, to our great regret, Mr. Druce's "Notes on the New Edition of Babington's 'Manual of British Botany'" had to be printed from an uncorrected proof, and there are several errors in the spelling of scientific names; but for the most part these are too evident to cause risk of misunderstanding. A few, however, would convey a false meaning, and the following corrections must therefore be specially noted:—

Page 48, *line* 29, insert = between "*H. violacea* (Boreau)" and "*H. sessilifolia* (Peterm)"; and on *line* 30 insert = between "*H. atrorubens* (Schultz)" and "*H. ovalis* (Bab.)."

Page 50, *line* 9, for "*kyrtosstyla*" read "*kyrtostyla*"; and *line* 11, for "*L. monogyna*" read "*C. monogyna*"; *line* 17, transpose "*baltica*" and "*uliginosa.*"

Page 51, *line* 1, for "*Aerrafalcus*" read "*Serrafalcus.*"

Correction.—Kindly correct a mistake in my "Contributions toward a Flora of Caithness," in which, under *Deyeuxia neglecta*, on *page* 42, *line* 29, I have written "Shoolbred" instead of "Rev. H. J. Riddelsdell."—Ar. Bennett.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1905.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Wild Cats in Ross-shire. A. J. M'Connochie. *The Field*, 14th January 1905, p. 73.—Records the capture of a specimen in Strath Cuileinach, weighing 14 lbs. and measuring 49 inches in extreme length.

The Little Shrew in Aberdeenshire. George Sim. *Zoologist*. January 1905, p. 31.—Example found by Miss D. Hamilton at Skene House in October 1904.

The Affinities of the Orkney Vole (Microtus orcadensis, Millais). C. J. Forsyth Major. *Ann. and Mag. Nat. Hist.* March 1905, pp. 323-324.—Refers this interesting new British mammal to the same sub-genus of Microtus as the Common Field-Vole (*M. agrestis*).

The Pacific Eider in Orkney. Hy. S. *The Field*, 4th February 1905, p. 190.—Records a specimen shot at Graemsay, on 14th December, by George Sutherland, and sent to a Scarborough dealer. The bird had been identified by Dr. R. Bowdler Sharpe and exhibited at the British Ornithologists' Club.

Another note on this occurrence is given by H. W. Robinson, *The Field*, 18th February 1905, p. 277.

Insects on the Fife Coast. J. W. H. Harrison, B.Sc. *Ent. Record*, January 1905, pp. 23-25.—An interesting note, referring to a large number of species of Lepidoptera taken during the month of August 1904.

Platyptilia pallidactyla at Dumfries. W. G. Clutten. *Ent. Record*, March 1905, p. 73.—Corrects an identification, the species being formerly recorded as P. ochrodactyla.

Coleoptera in the Peebles District in 1904. James E. Black, F.E.S. *Ent. Record*, March 1905, p. 70—Records the capture of 20 species in the vicinity of Peebles, including Salpingus ater, Sinodendron cylindricum, etc.

Coleoptera at Rannoch. T. Hudson Beare. *Ent. Mo. Mag.* January 1905, pp. 18-19.—Records 18 species taken in June and July 1904.

Coleoptera taken in the Flannan Islands by Mr. W. Eagle Clarke. T. Hudson Beare. *Ent. Mo. Mag.* January 1905, pp. 19-20.—Substantially the same information as that contained in the present volume of the *Annals* (pp. 20-22).

List of British Dolichopodidæ with tables and notes (*continued*). G. H. Verrall. *Ent. Mo. Mag.* February-March 1905, pp. 50-57.—Numerous Scottish records are given in this valuable paper.

Two Additional British Species of the Dipterous Genus Erigone, Rob.-Desv. Ernest E. Austen. *Ent. Mo. Mag.* March 1905, pp. 57-60.—Erigone truncata, *Ztt.* noted as taken by Col. Yerbury at Aviemore and Glenmore in Inverness-shire, and at Golspie, Sutherlandshire.

BOTANY.

The Late George Brebner. By D. H. Scott, F.R.S. *Journ. Bot.*, 1905, pp. 60-61.—A brief obituary, with references to his work as an accurate and able histologist and artist in the investigation of stems of vascular plants, recent and fossil, and of Algæ. A native of Aberdeen, Mr. Brebner died in his fiftieth year, in Bristol, where he was lecturer on Botany in University College.

The Flora of Buchan. By James W. H. Trail, A.M., M.D., F.R.S. *Trans. Buchan Field Club*, 1904, 56 pp.—Briefly notes features of Buchan, enumerates the vascular plants, with indications of habitats and frequency in Buchan; analyses the flora by habitats, and by relations to man's influence; discusses probable origins of flora, and indicates recent additions to local lists.

Notes on Limonium. By C. E. Salmon, F.R.S. *Journ. Bot.*, 1905, pp. 5-14, 54-59.—A discussion of the forms of the genus (= *Statice* of most British floras), with localities. For Scotland *L. vulgare*, Mill., f. *pyramidale*, Dumfries, Kirkcudbright, Wigton and ? Shetland; *L. humile*, Mill., f. *nanum*, Dumfries, Kirkcudbright, and Wigton.

Notes on Some Additions to the Botany of Ayrshire. By A. Gilchrist. *Annals of Kilmarnock Glenfield Ramblers' Society*, 1901-4, pp. 37-42.

The Greatest Trees of the Kilmarnock District, with their Associations. By D. Landsborough. *Annals G. K. R. Soc.*, 1901-4, pp. 20-36.

Additions to the List of Ayrshire Ferns. By A. Laing. *Annals K. G. R. Soc.*, 1901-4, p. 43.

BOOK NOTICES.

The Cambridge Natural History. Vol. VII. Hemichordata. By S. F. Harmer, Sc.D., F.R.S.; Ascidians and Amphioxus, by W. A. Herdman, D.Sc., F.R.S.; Fishes, by T. W. Bridge, Sc.D., F.R.S.; and G. A. Boulenger, F.R.S. (London: Macmillan and Co., Ltd., 1904.)

This volume fills an important want in modern natural history literature. Many years have elapsed since a comprehensive treatise on Fishes has been issued by the British press, and many, great, and far-reaching have been the discoveries made relating to this great and varied Class of Vertebrates in the interval. Of the present volume no less than 589 pages are devoted to the consideration of Fishes, wherein their systematic position, external characters, skeleton, internal organisation, muscular and nervous systems, classification, and finally their systematic treatment under Subclasses, Orders, Suborders, Families, and Subfamilies, both fossil and recent, are dealt with. Under these numerous sections a vast amount of information is afforded; and Professor Bridge is to be congratulated on having secured the co-operation and assistance of such eminent specialists as Mr. Boulenger and Dr. Traquair.

The treatment of the other groups covered by the volume leaves little or nothing to be desired. Professor Herdman is well known as the leading authority on the Ascidians, and his treatment of their anatomy, life-history, and classification is thorough and masterly.

Dr. Harmer's contribution deals with a smaller group, but it is nevertheless an important one, for his section comprises, among other marine forms, the famous Balanoglossus, whose position in the animal kingdom as an ancestor of vertebrates has made that worm-like creature famous in the annals of natural history.

The volume is the most bulky of the series yet issued, for it runs to no less than 760 pages; and its illustrations are excellent, chiefly original, and 440 in number.

Practical Hints for the Field Lepidopterist. By J. W. Tutt, F.E.S. Part iii. Price 6s. net (interleaved). (London, Elliot Stock; Berlin: R. Friedländer and Sohn.)

This is presumably the concluding part of an exceedingly useful publication by an author whose energy and zeal for his subject seem almost inexhaustible. The major portion of the work, which runs to 166 pages without the blank interleaves (and which therefore should surely have been issued in a cloth cover!), is devoted to additional hints arranged month by month, with separate paragraphs for the main groups of butterflies and moths. The enormous number of suggestions, so valuable in themselves, are rendered in this part infinitely more useful and accessible by the addition of an index, which, by the way, covers also the two previous portions. A special feature, however, of the present instalment is the series of chapters of a more general nature, devoted to subjects which are of the deepest interest to the collector, and about which little of any practical use has as yet been written. After an introductory chapter entitled "Collectors, Collecting, Collections," we are treated to a capital account of the Eggs and Egg-laying habits of these popular insects, in which the most useful advice is given as to how to obtain eggs in confinement, how to manipulate and preserve them through the winter, how to send them through the post, and numerous other points. Then follows a still more valuable chapter on the preservation, photographing, and description of the eggs, also a chapter on larvæ and one on pupæ, in both of which we find information often required by the student but seldom given in the multitude of works on Lepidoptera which have appeared in recent years. Like other contributions to entomological science by Mr. Tutt, the present work is characterised by its thoroughness, accuracy, and extreme lucidity. In short, we can safely say that we have seldom seen so much information of real practical use got together into such a small space, and this fact, coupled with the happy idea of interleaving the work, should inspire and encourage the novice and experienced collector alike to the making of original observations. Every entomologist should possess these "Hints," and although the price at first sight would seem somewhat large, yet we can assure the lover of moth or butterfly that he will get full value for his money. Our readers' attention should also be directed to the beautiful photographic plates (of which there are seven) accompanying the text of the introductory chapters. P. H. G.

An Account of the British Hieracia. By W. R. Linton, Vicar of Shirley, Derby. London: West, Newman and Co., 1905.

Mr. Linton has been well known for several years as one of the few that venture on the critical study of the genus Hieracium; and he has turned his knowledge, wide and precise—gained in their habitats and from herbaria and books, to the help of British

botanists in the issue of this most useful volume. The monograph is intended to give adequate descriptions of the forms named without such descriptions in the "London Catalogue, ed. ix., or discovered since in Britain, thus filling gaps left by Mr. F. N. Williams in his treatment of the genus, in "Prodromus Floræ Britannicæ." Mr. Linton discusses the origin of the abundance of forms on record, and states reasons for the view that few if any are due (as permanent forms) to hybridity. In his garden over a hundred different forms have been cultivated many years and have reproduced themselves freely; yet no hybrids have shown themselves. The true causes of the numerous forms he regards as the inherent tendency to variation, and climatic influences, such as altitude, soil, humidity, exposure, or shade—influences peculiarly active in mountain regions. Hawkweeds, he considers to be "exceedingly plastic and mobile," and "highly susceptible to the influences of environment." The characters derived from branching of inflorescences and from receptacular alveoli are discussed. A synopsis of the genus occupies pages 1 to 8; while 86 pages are assigned to descriptions of the several species and varieties, with notes on features of special interest, and brief indications of the distribution of each form in Britain.

Only those that must be regarded as not owing their place in Britain to man's aid are noticed, yet the number recognised as species amounts to 124, and the varieties and subforms of some of these are numerous. Several forms are described here for the first time, some of these being named by the author, others by the Rev. Augustin Ley. The monograph will be found indispensable by every student of the genus Hieracium.

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No. 55] 1905 [July

ZOOLOGICAL NOTES FROM THE LOG-BOOK OF THE BEN NEVIS OBSERVATORY.

Communicated by R. T. Omond, Esq.

[We are indebted to Mr. Omond for the following extracts relating to Natural History culled from the Log-Book of the Ben Nevis Observatory from 1872 down to the date of the closing of the Station.

These items, dealing as they do with the various animals inhabiting or visiting the highest point in the British Islands (4406 feet), have an interest peculiarly their own. As the information relating to the various species is necessarily scattered throughout the records, the following short summary has been prepared, dealing with the different species of Vertebrates mentioned. A few other species are known to have occurred, and these have been added in order to make the contribution as complete as possible. These additional species are given within square brackets, along with the reference to literature in which they are recorded.]

MAMMALS.

[Pigmy Shrew (*Sorex minutus*). — Shrews were frequently caught and brought in by the Observatory cat ("Scot. Mountaineering Journ." vii. 173).. A specimen captured on the 25th August

1896, and sent to Eagle Clarke, belonged to this species, as no doubt did the others.]

Fox (*Canis vulpes*).—Not an unfrequent visitor to the summit and its neighbourhood.

Stoat (*Mustela erminea*).—A resident species, and evidently not uncommon.

Weasel (*Mustela nivalis*).—Some, perhaps all, of the records in the Log relating to this animal refer to the last-named species. It is said, however, to occur at the very summit ("Scot. Mountaineering Journ." vii. p. 172). We should like confirmation of the occurrence of this species at or near the summit.

Brown Rat (*Mus decumanus*).—Has been observed on three occasions—on the 18th of May 1892, on the 26th April 1901, and on the 19th January 1904.

Common Mouse (*Mus musculus*).—No doubt a number of the references to this species in the Log really refer to the Field Vole. In the "Mountaineering Journal" (*t.c.* p. 172) this little mammal is said to have been captured in the Observatory where it has probably been introduced.

Field Vole (*Microtus agrestis*).—A common resident. It has been captured on several occasions in the Observatory buildings, and had probably established itself there. Specimens have been sent to the Royal Scottish Museum for identification.

Mountain Hare (*Lepus variabilis*). — Has been seen on the summit on several occasions. It is abundant at lower levels.

Red Deer (*Cervus elaphus*).—One was seen near Buchan's Well (3500 feet) on 11th March 1902. Some of the eastern slopes of the mountain lie within the Corryhoillie deer-forest.

BIRDS.

Raven (*Corvus corax*).—Frequently seen at all seasons.

Sparrow (*Passer domesticus*).—A Sparrow was observed on the roof of the office of the Observatory on 12th September 1898.

"Redpoll" [? Twite].—One is logged as having been seen on 15th September 1894.

Snow Bunting (*Plectrophenax nivalis*). — The most frequently observed of the higher animals. It is resident, and observed all the year round. Several pairs nest in the vicinity of the summit. Their nests, however, have not been found; but the young birds have been seen on several occasions.

Redbreast (*Erithacus rubecula*).—One seen at the Observatory on the 21st of April 1893.

[Meadow Pipit (*Anthus pratensis*).—In the "Scot. Mountaineering Journ." (*t.c.* p. 173) this species is said to be abundant, but it is not stated whether it occurs at or near the summit of the mountain.]

Cuckoo (*Cuculus canorus*).—Has been heard on several occasions in May and June. On the 23rd May 1898 one was found dead on the snow at over 4200 feet.

"Hawks."—There are several entries of the visits of "hawks," and a Sparrow-hawk (*Accipiter nisus*) is recorded for 11th August 1899. In the majority of cases, perhaps all, these visitors were most probably Merlins (*Falco æsalon*). Colonel Fielden, who ascended the Ben on the 27th of August 1896, found the remains of three male Snow Buntings recently killed, most likely the work of a Merlin ("Trans. Norfolk and Norwich Nat. Soc." vi. p. 245).

Golden Eagle (*Aquila chrysaëtus*).—Is alluded to occasionally in the Log. Mr. Raeburn remarks ("Scot. Mountaineering Journ." vii. p. 172) that a pair is usually to be seen on the north-east precipices.

Ptarmigan (*Lagopus mutus*).—Is occasionally seen on the summit, and is abundant 1000 feet below. Grouse (*L. scoticus*) have been seen at over 3500 feet, *i.e.* above Buchan's Well.

Insects.

There are a number of entries in the Log relating, in general terms, to the occurrence of Insects. Mr. W. S. Bruce, when stationed at the Observatory, made several collections, and these were submitted to experts to report upon, and the results published in our pages. These dealt with the Coleoptera (see "Annals," 1896, pp. 28-37; and 1898, pp. 30-31) and Hymenoptera and Hemiptera (*op. cit.* 1896, pp. 165-168; and 1898, pp. 80-81).

Botany.

[Short accounts of the plant life appeared in the "Trans. Norfolk and Norwich Nat. Soc." (vi. pp. 245-247) by Colonel W. H. Fielden, C.B., and in the "Scot. Mountaineering Journ." (vii. pp. 171-2) by Mr. Terras.—Eds.]

The hours are according to Greenwich time, midnight being the 24th hour.

1892.

February 13.—Two Snow Buntings seen at the cliff at 8 hours, the first this winter.

February 26.—A Snow Bunting seen at the door of the Observatory.

March 23.—A Mouse[1] was seen in Snow porch at 23 hours.

March 26.—A Snow Bunting seen in Snow porch to-day.

March 27.—A Mouse seen in the Snow porch.

Foggy or overcast all day. The coldest day yet observed at Ben Nevis Observatory. Mean temperature 8°.1. Slight showers of snow.

May 18.—A large Rat seen on roof at 1 hour.

1893.

January 10.—A Stoat was trapped inside the Observatory to-day. It was pure white—all but two inches of the tail, which were black.

February 6.—A Snow Bunting seen this morning near the Observatory.

February 21.—Shortly after 12 hours six Snow Buntings were seen at M'Lean's Steep, a few hundred yards to the westward of the Observatory.

March 20.—At 11 hours a Snow Bunting seen near the doorway.

March 22.—A Snow Bunting seen again this morning at 11 hours.

April 21.—A Redbreast seen on office roof at 5 hours.

Sky almost cloudless. Light S. and S.E. winds. Temperature 37° to 47°, and air dry.

July 26.—A Ptarmigan was seen on summit to-day.

September 4.—Two or three Butterflies[2] were seen on the summit to-day.

No fog, and air very dry. Sky covered with high cirrus in forenoon, but clear after 15 hours. Haze gradually thickening all afternoon.

November 9.—A Mouse was seen in lobby of telegraph room.

1894.

January 6.—A Snow Bunting seen at porch to-day.

March 19.—Mouse seen and caught, as it was quite tame, but was let off again.

March 24.—Snow Bunting seen at 15 hours, and a Mouse in Snow porch at midnight.

[1] Some of the references to Mice undoubtedly refer to the Field Vole (*Microtus agrestis*).

[2] Mr. Bruce has seen the Tortoise-shell Butterfly (*Vanessa urticæ*) at the summit.

June 2.—Two Ravens seen at 6 hours.

June 7.—A Mouse seen in doorway at 11 hours.

September 7.—A covey of five Grouse seen above Buchan's Well (3500 feet) this afternoon.

September 15.—A Redpoll was seen on a ledge of rock near the north cliff this afternoon.

November 4.—At 5 hours a Mouse seen in front of the house.

December 5.—About 16 hours 30 minutes a Stoat seen at scullery window, yellowish white in colour with black tip to tail.

1895.

March 12.—A Mouse was caught alive in the kitchen to-day.

April 15.—A Snow Bunting was seen at 5 hours, the first noticed on the summit this year. Throughout the day it was seen several times, and four were seen at 13 hours. A Raven was seen at that hour also.

June 13.—Footprints of a Hare seen round the Observatory, and traced for 300 or 400 yards southward.

June 17.—A very white plumaged Snow Bunting seen.

July 27.—A Common Field Vole (*Microtus agrestis*) was seen to-day in the vicinity of the Observatory.

July 28.—The Vole was again seen to-day; also five Buntings together, some of which appeared to be young birds.

July 29.—In the early morning as many as ten or twelve Snow Buntings, some of which were fledglings, were seen close to the building.

August 13.—A Common Field Vole was again seen.

August 23.—A Raven was heard at 18 hours, and many Buntings were seen at 5 hours.

September 13.—Two Ravens were seen at the west end of summit at 6 hours, and one at 7 hours.

September 20.—A Raven was hovering over the summit and Observatory at 7 hours, and a Ptarmigan was started near the east end of summit.

October 16.—A Raven was seen at 10 hours.

Summit clear most of the day, air very clear but almost saturated.

October 23.—Two Ravens seen at 13 hours.

November 2.—Eight Snow Buntings seen at 7 hours, and a Raven at 9 hours.

December 10.—At noon two Ravens were hovering over the summit.

December 20.—While ascending the hill to-day, Mr. W. S. Bruce saw tracks of a Fox (or Foxes) from the Lake (1700 feet) to the Plateau of Storms (4000 feet); also tracks of a Weasel at 2500 feet; of a Hare at 2500 feet; of a Ptarmigan (?) at 2000 feet. He picked up Insects in the snow at 2200 feet (also on the 18th December at 2500 and 2200 feet; those at 2200 were probably *Collembola*). At the Plateau of Storms he emerged from the thick haze which extended to the foot of the hill; at the top of this haze was a layer of fog which was breaking up at that time. There was noted what appeared to be the track of a Fox on the roof and at window of the Observatory which must have been there all night.

December 31.—At 12 hours 30 minutes the cat caught a Common Field Vole (*Microtus agrestis*). At 16 hours the fresh tracks of a Fox were seen in the Plateau of Storms (4000 feet).

1896.

January 4.—Some Flies were observed frozen on the snow to-day.

January 22.—At 15 hours a Raven was seen near the Observatory.

February 8.—Living Flies were seen on the snow to-day, and some were captured.

February 15.—A Snow Bunting was seen on the roof of the Hotel at 9 hours, and two flew round the Observatory at 16 hours, going over the cliff past the Cairn; another flew past the Observatory at 16 hours 20 minutes. Flies at 4000 and Spiders at 3400 and 4300 feet were observed.

In the afternoon the summit was clear, but fog filled the valleys to 3000 feet; later the sky became overcast, and these clouds settled down as fog on the summit.

February 17.—Snow Buntings and a Raven seen at 3500 feet.

February 18.—A Snow Bunting seen at 16 hours.

There is so little snow on the hill-sides that a horse with a load of fresh provisions was taken up to the Observatory to-day.

February 20.—Tracks of two Foxes seen at about 4000 feet.

February 21.—Two Snow Buntings and a Raven seen to-day, and marks supposed to be of an Eagle on the snow near the summit.

February 22.—Snow Bunting seen at kitchen window.

March 11.—Snow Bunting seen at kitchen window at 6 hours, and during the day many dead Flies on the surface of the snow.

March 14.—Raven seen in afternoon.

March 30.—Snow Buntings seen about the summit yesterday and to-day.

April 2.—Snow Buntings seen about the summit to-day.

April 9.—Flies seen on surface of snow, and tracks of a Fox at about 4000 feet.

April 14.—Snow Buntings seen about summit to-day, and several Flies on surface of snow.

April 23.—Snow Bunting and a Raven seen; also several Flies on the snow.

May 1.—A Raven seen at 11 hours.

May 31.—Snow Buntings were either seen or heard on every day of the month, and Flies, etc., were almost daily seen on the surface of the snow.

June 12.—Two large birds, probably Eagles, were seen crossing Ben Nevis in a south-easterly direction about 14 hours.

July 28.—Eagle seen over the Aonach Beg at 6 hours 15 minutes.

July 31.—Four Ravens seen flying about the summit at 20 hours.

September 4.—A Raven seen near the cliff at 17 hours.

November 15.—Three Snow Buntings seen at M'Lean's Steep (4200 feet) at 10 hours 45 minutes; none had been observed for about a month previously.

November 16.—A Snow Bunting was heard on the roof of the Observatory at 9 hours, and again at 13 hours.

1897.

January 4.—Ravens were seen at 10 hours and 16 hours, and the tracks of a Fox were traced from M'Lean's Steep past the Observatory to the east end of the hill.

January 14.—Tracks of a Weasel (Stoat?) seen near the Hotel.

January 18.—A great number of Fox tracks were seen on the Cairn Dearg (3900 feet), and two Ravens were seen there.

March 29.—A Raven seen at 16 hours.

April 10.—A Raven seen at 13 hours.

May 18.—Snow Buntings seen in forenoon.

May 20.—Buntings seen at noon, and a Raven at 17 hours.

May 21.—A Raven seen at 10 hours.

May 22.—Snow Bunting seen at 13 hours.

May 23.—Snow Bunting seen at 9 hours.

May 24.—Snow Bunting seen at 8 hours, and a Butterfly at 11 hours.

June 4.—The call of the Cuckoo was heard on the south side of the hill.

June 27.—A Raven seen near the Observatory at 12 hours 40 minutes.

October 3.—Two Snow Buntings seen near the Observatory door at 6 hours.

October 14.—Weasel tracks seen near the summit cairn this morning, and a Raven flying about the east end of the hill.

October 24.—Three Ptarmigan seen at M'Lean's Steep (4200 feet) at 15 hours 20 minutes.

October 25.—Raven and Snow Bunting seen this afternoon.

November 3.—Three Ravens were seen flying about the summit in the afternoon.

1898.

February 4.—Raven seen at 17 hours; the only bird seen near the summit for some time. No Snow Buntings have as yet been noticed this year.

March 7.—The tracks of a Weasel were seen about the windows this morning.

March 9.—Shortly after 19 hours a Mouse (or Vole) was seen running across the kitchen floor and into a bedroom, where it was caught and put into a tin box. It was found dead about two hours afterwards.

April 14.—A Raven seen near the cliff in forenoon, and a Snow Bunting near the Observatory in afternoon. Numerous Flies seen on the surface of the snow between the Observatory and M'Lean's Steep.

April 18.—Two Snow Buntings seen in early morning.

April 24.—A Snow Bunting and a Raven seen to-day.

May 16.—Two Snow Buntings were seen at 14 hours, and a Raven at 16 hours.

May 23.—A Cuckoo was found lying dead on the snow near the top of M'Lean's Steep (4200 feet) at 21 hours.

June 13.—Raven seen at 17 hours.

June 26.—Snow Bunting seen on summit cairn shortly after 16 hours.

July 14.—Spider seen in kitchen at 15 hours.

July 19.—Raven heard at edge of cliff at 20 hours.

July 20.—Snow Bunting heard singing at various times during last three days.

July 25.—A young Snow Bunting which the cat brought in yesterday, alive but injured, died this afternoon.

August 16.—A Sheep seen on summit at 7 hours.

September 8.—Three Snow Buntings seen.

September 12.—A Sparrow seen on office roof.

October 16.—Nine Snow Buntings seen near the hotel at 10 hours.

October 17.—Two Buntings seen at 15 hours.

October 28.—Four Ravens seen flying about the summit at 12 hours.

October 29.—Seven Buntings seen at 7 hours.

November 8.—A number of Snow Buntings were seen near the cliff edge at 16 hours.

November 11.—A number of Snow Buntings were flying about the summit all day.

November 19.—Snow Buntings seen in forenoon—three or four at a time.

1899.

January 10.—Raven seen at 9 hours.

March 30.—Snow Bunting seen at 18 hours.

April 7.—Snow Bunting seen at 16 hours.

April 16.—Snow Bunting seen at 10 hours.

April 20.—Snow Bunting heard singing at 10 hours, and five Ravens seen flying about the cliff at 17 hours.

April 22.—Snow Bunting seen at 5 hours, and a raven at noon.

April 28.—Snow Bunting seen at 13 hours.

May 4.—Snow Buntings seen at 17 hours.

May 8.—Cuckoo heard from Buchan's Well (3500 feet) to-day.

May 9.—A number of dead Flies were seen on the hard frozen snow surface between the Observatory and M'Lean's Steep between 4 hours and 5 hours.

The cat caught a Mouse (or Vole) in the kitchen. Apparently there are several of them, as they have been heard in the building all spring.

May 11.—The cat caught another Vole to-day.

May 12.—Snow Bunting seen at 14 hours.

May 15.—Fox tracks seen in snow at 3 hours.

May 19.—Raven seen flying about the summit at 13 hours.

May 23.—Snow Buntings seen at 8 hours.

May 24.—Two Snow Buntings seen at the Observatory doorway at 13 hours.

May 27.—Cuckoo heard faintly at 4 hours.

July 27.—The cat caught a Mouse (? Vole) in the scullery this evening.

July 30.—The cat caught a Mouse in the coal cellar this afternoon.

August 11.—Sparrow-hawk (? Merlin) seen on summit at 10 hours.

August 25.—Two Ravens and two Hawks on and about summit at 5 hours.

September 1.—A number of Snow Buntings were seen about the summit throughout the day.

September 29.—A flock of Snow Buntings seen at 18 hours.

October 5.—A Raven seen at 15 hours.

October 19.—A Raven seen flying over summit at 15 hours.

November 8.—A Raven seen at 8 hours.

November 9.—Snow Buntings seen at 15 hours.

November 20.—Snow Buntings seen at 17 hours.

December 2.—Three Ravens seen at 12 hours.

1900.

January 18.—Two fine Ravens seen at cliff edge to-day.

January 31.—A Raven seen near cliff to-day.

February 1.—Raven seen on summit at 16 hours.

February 5.—Three Ravens seen on summit at 14 hours.

February 21.—At 8 hours three Snow Buntings and two Ravens seen near the Observatory.

March 3.—Between 16 hours and 17 hours two Ravens and a Snow Bunting were seen.

March 8.—Two Ravens seen at 11 hours.

March 28.—Three Ravens and a Snow Bunting seen in the afternoon.

May 18.—Snow Bunting seen at 10 hours.

May 22.—A Raven seen near cliff at 11 hours.

November 3.—To-day a white Ptarmigan was seen on summit.

November 4.—A few Snow Buntings seen at 8 hours.

November 18.—A Raven seen at north-east cliff.

November 23.—A Raven seen near cliff.

1901.

January 5.—Raven seen near cliff at 15 hours.

January 14.—Three Ravens seen at the north cliff.

March 20.—Raven and Hawk seen to-day.

March 25.—Eagle seen flying over summit during the afternoon.

April 12.—A Snow Bunting was seen near the cliff to-day.

April 21.—A Raven seen near the Observatory to-day.

April 24.—A Raven seen on the summit in the afternoon.

April 26.—To-day the cat caught a young Rat in the Observatory.

April 27.—To-day a number of Snow Buntings were seen near the Observatory.

April 28.—A Raven seen at 11 hours.

April 29.—A Raven and a number of Snow Buntings were seen flying past the Observatory this afternoon.

May 2.—A Raven and a number of Snow Buntings seen to-day.

May 8.—A number of Snow Buntings were seen near the Observatory. The cat caught a Mouse to-day.

May 17.—A Snow Bunting was seen close to the Observatory during the afternoon.

October 3.—At 16 hours 45 minutes a large Weasel [? Stoat] was seen going from the Observatory to the Ordnance Cairn.

October 15.—Tracks of a Weasel were seen on the fresh snow this morning. The snow is about 6 inches deep.

October 29.—At 16 hours a number of Snow Buntings were seen flying about the Observatory.

November 3.—A great number of Snow Buntings were flying about the Observatory all day.

November 14.—Shortly after 1 hour a Mouse was caught in the passage leading to telegraph room.

December 24.—This morning the cat caught a Mouse.

1902.

March 1.—At 11 hours two Ravens were seen at the north cliff.

March 9.—A Snow Bunting seen on summit at 11 hours.

March 10.—Two Ravens seen on summit at 11 hours.

March 11.—This evening a Deer was seen to the south of Buchan's Well (3500 feet), and a Wild Goat on the Cairn Dearg (3900 feet).

March 27.—A Raven seen at 16 hours.

March 30.—Six Snow Buntings and a Raven seen this afternoon.

April 12.—After 17 hours several Snow Buntings were seen flying about the cliffs.

April 18.—A Fly seen on the snow on summit, and a Raven at the Plateau of Storms (4000 feet).

June 6.—Snow Buntings are now seen daily on the summit.

July 18.—To-day a Vole was caught at the Hotel door while eating corn along with the horses.

July 20.—In the forenoon two Sheep were seen on the summit near the Hotel. This is the second time this season that Sheep have been seen on the top.

September 27.—After 6 hours a Hawk was seen flying over the summit, and in the evening about a dozen Ravens were flying about the north cliff.

September 28.—About 6 hours a Ptarmigan was seen flying past the Observatory.

October 10.—Snow Bunting seen about the summit to-day.

October 11.—Snow Bunting seen at noon.

October 12.—Snow Bunting seen at 11 hours.

October 14.—Snow Bunting seen at 17 hours.

October 18.—Raven seen near cliff at 11 hours. Snow Buntings heard at 11 hours, and seen at 17 hours.

October 20.—Snow Bunting seen at 9 hours.

October 21.—Snow Bunting seen at 17 hours.

October 27.—Snow Bunting seen at 7 hours.

November 2.—Tracks of Weasel seen near the Observatory tower to-day.

November 13.—Two Ravens heard on the cliff.

November 17.—A white Weasel (stoat?) seen near thermometer screen at 16 hours.

November 21.—A white Weasel seen at 14 hours.

November 23.—Tracks of Weasel seen on the snow.

November 24.—Snow Bunting seen at 8 hours.

December 2.—Tracks of Weasel seen on snow.

December 7.—A Raven seen at 13 hours.

December 8.—Snow Buntings seen during the day.

1903.

February 15.—Some Snow Buntings were seen in the afternoon, and a Raven in one of the gorges of the cliff at 17 hours.

April 16.—A Snow Bunting seen near the cliff in afternoon.

April 21.—Two Snow Buntings seen on Observatory roof in afternoon.

April 24.—Snow Bunting seen on tower at 17 hours.

April 25.—Snow Bunting seen near cliff in afternoon.

December 18.—Fox and Weasel tracks seen on snow this morning.

December 26.—A Raven seen at 16 hours.

1904.

January 23.—Two Ravens seen at M'Lean's Steep.

February 5.—Two Snow Buntings seen at 13 hours.

March 5.—A pair of Ravens seen at 11 hours 30 minutes.

March 9.—A Raven seen in evening.

March 20.—Snow Bunting seen at 8 hours.

May 27.—Raven seen at 11 hours near the cliff.

June 19.—Rat seen in early morning, and again at night, feeding (on spilt corn?) in front of the kitchen window.

June 23.—A large Hare seen on summit at midnight.

June 26.—Heard call of Ptarmigan and croaks of Raven at 4 hours.

August 10.—Two Weasels seen near the stable in forenoon.

Nothing more noted till the close of the record on 1st October 1904.

NOTES ON THE BIRDS OF ST. KILDA.

By Rev. Neil Mackenzie.

Compiled from his Memoranda by Rev. J. B. Mackenzie, F.S.A. (Scot.).

(*Continued from p.* 80.)

The Shearwater [*Puffinus anglorum*], which is here called "serabaire" from the way it pats the water, arrives towards the end of February. About the end of March, or at times a little earlier, it begins to visit its breeding places. It makes its nest in holes either under boulders or in holes like those of a rabbit. It is not, however, till May that it lays its solitary egg, which it hatches in six or seven weeks. If the first egg is taken away many of them will lay a second

time, and if that egg is removed several will lay a third time, in each case after an interval of fifteen or sixteen days. The young bird, which is called "fathach," is fed in the nest till it is fledged. It, like the young Fulmar, is also very fat and is much relished as food. The old birds when fat, which they often are, are also considered good eating. As they never leave their holes by day, but always by night, it is difficult to estimate their numbers, but I believe that they are about as numerous as the Fulmar. When going away from the nest, and when returning, it utters a peculiar cry, and the same sound is frequently heard from the holes during the day, and is the only sign that the birds are breeding in your vicinity. When alighting on its return from the sea it strikes the ground with considerable force, which seems to stun it for a few seconds. It cannot alight easily on account of the shape of its wings. These wings are fairly large and powerful, so that it can fly and manœuvre with great ease, but at the same time they are of the diving pattern. A truly aerial bird has wings which, when expanded, are nearly straight from point to point and have great sustaining power; but a diving bird's wings are, when expanded, crescent-shaped and have little sustaining power. As the wings of the Shearwater are fairly large, but still of the diving pattern, they appear less expanded and more crescent-shaped than those of any other bird. Hence it is very frequently called "cromag," or the crescent-shaped, and from this peculiarity you can identify the bird a long way off. This shape of wing, while not adapted for hovering, yet enables the bird to fly very fast. As the wings are used most frequently for flying under water, there no sustaining power is required—only progress forward, and for this a diver's wings are admirably adapted. I always heard the people say that the divers progressed by flying under water, but I was unable satisfactorily to verify the fact till last year (1840). It is very seldom that the conditions are favourable for seeing distantly what goes on under water, but on this occasion everything was in my favour. I was standing on a high projecting cliff where the bottom was white sand, the sun was shining brightly, and the sea was smooth as glass and wonderfully transparent. There were below me a large

number of Guillemots and Razorbills, with a few Cormorants, who were quite unaware of my presence. Some lay on the rocks near the sea, basking in the sunbeams, while the rest fished. When they wished to descend they drew their wings and feathers close to their bodies; but as soon as they got under water they expanded their wings, but not so widely as in flying, and flew about with them in that position with great rapidity and in all directions. They used their wings for progression as a swimmer would his arms, and seemed to use their tails for guidance. Their feet were also in motion, and they caught their prey in their bills. The Cormorants were further away, and I could not see them so distinctly, but so far as I could see they moved under water in the same way. It is because of their way of alighting that the Shearwaters are most easily and frequently caught. The fowler, with his trained dog, waits near a place where he knows that there are several nests. During this momentary halt the dog pounces upon them and brings them to its master. In this way a clever dog may catch sixty or seventy in a night. The wings of the Shearwater, although of a different type from those of the other petrels, are yet so large that it can fly about and pick up its food from the surface like them. At the same time it can, and frequently does, settle on the water like the Guillemots, and pursue its prey under water as they do.

The STORMY PETRELS [*Procellaria pelagica*] arrive in detachments. At first a few, then more and more, till the whole body is collected. At first coming they for some time only hover about the rocks, but gradually they take to resting upon them by day, and in a little by night also, probably to satisfy themselves that there is no enemy about. They never, however, settle quietly or take full possession till about the middle of March. It is not till then that they are caught in any numbers. It is here called "aisleag," the little ferryman, from its habit of flying back and forward from point to point. It lays its egg, which is large, in a hole like that of the Shearwater, but, unlike it, goes to and fro by day. It has also the same habit of uttering its peculiar chirping cry in the hole all day. It hatches for about six weeks, feeds its young in the nest for about the same time, and leaves in

September. There are two species of them, the larger having its tail forked like that of the swallow [LEACH'S FORK-TAILED PETREL (*Oceanodroma leucorrhoa*)]. Otherwise they are similar in appearance and habits. The smaller variety is more numerous, and frequents all the islands of the group, while the other frequents only Boreray and the northern part of St. Kilda proper.

The GANNET [*Sula bassana*] is here called "suileire," the sharp-eyed. A few birds will sometimes come as early as the 13th of January, and from that time more and more gradually arrive. By the end of February only about a third of the birds will have come, and it is not till the end of March that they are caught in any numbers, and then only if the weather is suitable. When they arrive they are fat and very good eating. Indeed, all the birds which visit us are only good eating when they are fat, and as a rule the fatter they are the more palatable. Gradually, as the breeding season goes on, they get leaner, till by the time they leave us in October and November they are very lean indeed. They begin to lay about the 10th of May, and it is very probable that they all return to their old nests. The nest is made of grass and small sticks, which are renewed from time to time as hatching goes on. These materials decaying annually form a small mound which gets yearly larger. It lays one egg, which the parents hatch by turns for about six weeks, and then feed the chick for at least as long. When the young bird is first hatched it is quite naked, but soon a fine down begins to grow, which gradually gets very long. When it is about a month old it is called "guga," and looks like a young white lamb. If the first egg is taken away it will lay a second, and if it is again robbed it will lay a third time. All of them will not lay again. You may get on a ledge the first time say twenty eggs, the second time fifteen, and the third time about twelve; of course more than that number may lay again and select some other place for the new nest, but I do not think this at all probable. The same rule of numbers applies to all those birds which lay one egg, and if robbed lay again at all. After the young are hatched the parents from time to time line the nest with fresh grass. For this

work they always choose a windy day, and work on that side of the island towards which the wind is blowing. You will see patches quite white with them when so employed. Frequently when so engaged they seem to get tired and fall asleep. At such times, if any of the natives happen to be on the islands which they frequent, they can catch numbers of them in full daylight. When men are left on Boreray for some days to get a supply of feathers, if they want the boat sent to them before the time arranged for, they dig over a certain green patch as the signal. On one occasion the boat was despatched in response to such a signal, but to their mutual surprise found that they were not expected. It turned out that the gannets had selected this spot for their grass-cutting and had bared it completely. Before the young birds leave the nest they have moulted this early down, and are covered with dark speckled feathers which at a distance appear black. When it returns in spring it is distinctly speckled, and is then called by the same name as the young shearwater—"fathach." A little before it is ready to leave the nest it is very fat, but by the time it is fully fledged it is leaner.

These birds never breed on Soay or on any part of St. Kilda proper, but only on the islands of the Boreray group—Boreray, Stacklia, and Stack-an-armin. Martin says that in his time twenty-three thousand "gugas" were killed annually, but probably this is only a very vague estimate. Nothing like that number are killed now. Never since I came to the island have they killed in any year more than two thousand "gugas," and about the same number of old birds. About eighty of the old birds will yield a stone of feathers (24 lbs.). Last year (1840) they only secured a little more than twenty stones. It takes on an average eighty "gugas" when salted to fill a barrel. In general they are very fat, but some years they are quite lean and comparatively worthless. This also is true of all the birds which frequent the island; some years they are much leaner than others. From the information which I got from the natives, I do not believe that they ever in any one year killed more than five thousand "gugas," and from two to three thousand old birds. There is no reason why they

might not, if they liked, kill in a year five thousand "gugas" and four thousand old birds. As their bills are very sharp and they take a firm hold, it is not safe to seize them incautiously, or you may get your hand badly cut. It is only on dark, damp nights that it is easy to catch many of them. The natives of course select such times for their capture, and in the twilight ascend the rocks very quietly so as to cause as little alarm as possible. Before going to rest the different flocks leave several birds as sentinels, which are very vigilant. While on duty and there is no cause for alarm, they cry "grog-grog" incessantly. As these sentinels must be secured, the fowler crawls up to them very slowly and cautiously. If the sentinel is in the least alarmed he changes his notes at once, and the fowler must remain perfectly still till he again begins his "grog-grog," when he may resume his cautious advance. If they are successful in capturing the sentinels before they have taken alarm and uttered their third or danger call, they may secure large numbers, but if not instantly the whole flock is on the wing and will not again settle quietly that night. If, however, successful, they have only to cautiously advance and secure one by one the resting birds. They must be seized firmly by the neck and pressed to the ground while you twist the neck, lest they alarm the rest. Sometimes the birds wake up, and hearing a little sound but no cry of danger from the sentinels, are not alarmed, but come slowly up with their necks stretched out to investigate. These the fowler seizes as quietly as possible one by one, till sometimes he is able to kill every one in that flock. This finished they crawl on to another ledge, and then to another, till they have gone over all in the vicinity, or have secured as many as the boat can conveniently carry. As soon as it is day the birds which have been caught are all thrown down into the sea and secured by the boat below. They are now off for home, and on arrival the birds caught are divided equally among all the families in the island. As no rope can be ordinarily used, this fowling is rather dangerous work. They may slip in the dark, or if the wind suddenly rises they may be blown off the ledges.

The GUILLEMOT [*Uria troile*] is here called "lamhaidh,"

a handful. It comes early in February, and for a while at first acts very strangely. For three days in succession it will come regularly at daybreak to the rocks where it intends to breed. For the next three days none will return, but remain at sea. This it will generally do regularly, but there are occasions on which it will depart from this curious habit. About the middle of May it lays a single large egg on the bare rock. Their eggs are very pear-shaped, which keeps them from rolling off the sloping ledges. Even as it is, if these birds are disturbed and forced to rise from the nest many of the eggs will roll over. However, only on such rare occasions is the egg ever left in danger. Ordinarily, before the one bird rises the other bird has got secure possession of the egg. They hatch for five weeks, and then feed the chick on the rock for two or three weeks. After this they take it down to the sea. As the chick is not nearly fledged, and the nest is in the more inaccessible ledges often far from the sea, it is not apparently an easy matter to get it down, and must cost the parents many an anxious thought. If the ledge overlooks the sea there is no difficulty : the parent bird simply entices it to the edge of the rock and then pushes it over. But this is not often the case. Generally the ledge is so high up and so situated that it cannot be got down in this simple way. The parent bird in these circumstances takes a great deal of trouble to entice the chick on to her back ; but if this fails she seems to get impatient, seizes it in her bill and puts it there. Immediately she flies seaward, and by the time that she has got well over the sea, either she drops it or it falls off. It is very rarely indeed that she does not get it down safely. For the next ten days the parents spend a good deal of time teaching it to swim, dive, and forage for itself. When its education is finished they all go away, and if they have been allowed to hatch their first laid eggs this will be about the first of August. These birds are caught in either of two ways. Early in the season, when it has been ascertained that it is their day on shore, two men will go to a likely place, and as soon as the birds have left the rocks in the twilight one of the men will lower the other by a rope to the ledges which they have observed to be most thickly

peopled. There he has to wait all night while the birds are away feeding. Just before the earliest dawn he hides himself as close to the edge of the rock as possible, and holds up something white, as a handkerchief, on the rock beside him. The first comer seems to think that this is a still earlier arrival, and settles down beside it. It is at once pounced upon, killed, and held up in a sitting attitude in order to induce the next comers to settle down beside it. They return in little flocks of from half a dozen to a dozen, and out of each the fowler may catch two or three, or if lucky even more. He goes on in this way till it gets so light that no more will settle. Sometimes he may not be very successful, but in general he can catch from sixty to seventy. The danger here is that in his anxiety to seize a bird he may overbalance. In general, however, all goes well, and he is hauled up safely. The other way of capturing them is with the snaring-rod when they are hatching, and this way, as they breed in the more inaccessible rocks, is more dangerous than the other. If these rocks have to be reached from above it often requires the joint efforts of four or five men before one can be lowered down step by step to the required position. If at all possible there must be a second man stationed not far from him, so that he may be able to reach the end of the rod, take out the bird, and reset the snare. He has also to point out where the birds are, where the best footholds are situated, and make himself generally useful. Several who have come down so far together may be in the same way engaged on other ledges. When they have killed all the birds within reach those secured are gradually passed to the top, the fowlers follow, and the spoil is divided. That a rope may break is not a very common source of danger : much more common is a tuft of grass slipping from the rock under the foot, or a stone loosened either by the foot or the rope falling upon those below. Once when I was with them I had to dress a wound in a man's head from which the brain was protruding, caused by a stone falling upon him when fowling on Soay. He fortunately recovered. These birds are of no great value. They are not much esteemed as food, and their feathers neither bulk much nor are very valuable. It is the

same with all the birds of this class as regards their feathers. The feathers on the under part are close and short, and those on the upper part thin and deficient in curl. One Gannet will yield as much as ten of these and of better quality. They are very social birds, always flying, fishing, and sitting on the rocks in small companies. They are extremely numerous, and frequent all the islands of the group wherever there are suitable breeding places. I have seen seventeen basketfuls of eggs taken at one time from Stachbiorrach, and at another time the same season fourteen. These baskets hold each about four hundred of these eggs. Stachbiorrach is one of the smaller islets, and as probably not half of the eggs were robbed, and there are a large number always which are not breeding, the number frequenting this islet alone cannot have been under fifty thousand. Using this estimate and others of a different kind as a basis for calculating, the total number frequenting all the islands of the group cannot be fewer than a million. As no wood of any kind grows on the island these so-called baskets are made entirely of straw. They resemble large flat-bottomed beehives, but they are not constructed in the same way. No string or fibre is used. The straw is twisted into ropes and woven into shape. They are used for a variety of purposes, and are wonderfully strong and durable. Sacks for storing grain and feathers are also made in this way. For them the straw is twisted into much thinner ropes, and they are put together so that they are quite flexible. The making of straw ropes for these purposes and for binding down the thatch on their houses occupies much of the time of the men during the winter evenings. These eggs are very good eating when fresh. After they are incubated for a few days most of the egg appears when boiled to be changed into a rich thick cream, and in this condition they are also relished. Sometimes eggs, not only of this species but of some others which have not been hatched, are found late in the season. Some of these when cooked look like a piece of sponge cake, have a high gamey flavour, and are esteemed a great delicacy. Others are as bad as the most vivid imagination can depict.

The Razorbill [*Alca torda*] begins to arrive about the

25th of March, and towards the middle of May lays its solitary egg either in cracks and crevices of the rocks, or in cairns under flat stones. It sits for five weeks, and very soon after gets its young down to the sea. It is not so social as the Guillemot, often breeding in solitude, but more frequently, when the space admits, in colonies. The egg when fresh is considered very good eating, but the bird even when in condition only fairly so. It leaves for the season early in August. I have heard it said that this bird and also the Guillemot glues its egg to the rock, but I have carefully examined hundreds of them, but never could detect anything of the kind.

The PUFFIN [*Fratercula arctica*] begins to arrive on the 5th of April. If the weather is dull and damp it will arrive a few days earlier than if the weather is dry. Hence he is here called "buigire," the damp fellow. But although he does not come to the island till then, he is to be met with on the sea not far away in March. At first they visit the shore in small flocks, but if the weather is suitable they will all come on shore in a few days. If the weather becomes dry they will not remain on shore in such large numbers. Also, if the weather is dull and damp and they are on shore, should it come on rain, large numbers will go off to sea again just as if it had cleared up dry. Except of course such as are incubating, they always frequent in by far the largest numbers that side of the island on which the wind is blowing. Probably this is because their powers of flight being limited, they find it very difficult to rise with the wind or in a calm. At such times they bump several times against the ground before they get fairly under way, and if you are active you can catch several by hand. Soon after their arrival they begin to visit their breeding grounds, and in a few days start clearing out the old holes or digging new ones. A large number burrow under boulders, or find suitable holes among the stones of the many cairns. The others dig holes in the soil like those of a rabbit. Where the soil is suitable these holes are often very deep, but where the soil is shallower I have often broken into them when walking. The parents sit on their solitary egg by turns for about six weeks. When first hatched the chick, like those of the Gannet and Fulmar,

is bare and helpless, but it soon grows a crop of down. Both parents feed it very frequently, visiting it very often daily. Each time they bring with them three or four small fish each held in the bill by the head. The young are generally very fat, but some seasons when food seems to be scarcer not so much so. It is much relished by the natives. As soon as it is quite fledged, which, if the nest has not been robbed, will be about the end of July, they leave the island. It is by far the most numerous of all the birds which frequent these islands. There is not a suitable spot anywhere which does not swarm with them. Everywhere you see them in thousands, while at the same time the air is full of them coming and going. I estimate that there cannot be fewer of them than three millions. When they arrive they are in fair condition, but, contrary to what is true of most other birds, they get fatter and fatter during the time of incubating. Afterwards, however, they fall off in condition. Naturally one would suppose that this was due to their parental duties. But this cannot be the only reason, for the large number of birds of the species which do not breed exhibit the same tendency, and what is still more strange is, that these idle birds do not improve in condition during the summer season to the same extent as the breeding birds do. Selfishness does not pay. The number of birds and eggs of this species taken during a season is incredible. Men and women, boys, girls, and dogs pursue them incessantly. The dogs show which holes are occupied, when they are in general very easily got at. A very large number are caught in a snare which is only used for catching puffins. It consists of about a fathom of stout cord to which hair nooses, about nine inches long, are fastened at intervals of three or four inches. This is stretched out on any boulder or ledge which the birds are at the time frequenting, and fastened at the ends. The nooses along the sides are then carefully opened out to a diameter of about an inch and a half. The birds which had been disturbed are soon back again, and being restless little fellows it is not long before some of them have got their feet entangled in the nooses. Three or four are generally caught thus before the snare has to be reset. Sometimes very many more are caught, for

the Puffin is a very pugnacious little fellow, and when he finds himself caught attacks his neighbour. In this way a general fight is started, during which many are caught. On a suitable day a person with four or five of these snares, which are as many as he can attend to, may kill several hundreds. Many of these birds are also caught with the same rod which is used for snaring some of the other species. This rod is generally of cane, and about fifteen feet long, to the point of which a noose of horse hair, stiffened with strips of quill, is securely attached. In use this rod is slowly and quietly advanced towards the bird till the noose can be slipped over its head, when it is suddenly jerked tight, and the bird instantly jerked away so as not to frighten the others. An expert fowler can do this so quietly that he will capture several out of a number sitting together before the rest are alarmed and take to flight. The only two birds which can be caught thus at any time are the Puffin and the Razorbill. The others can only be taken in this way when they are hatching (*i.e.* incubating). The time when the Fulmar and the Guillemot can be approached is when the egg is nearly hatched. The Guillemot will often remain on the nearly hatched egg till the fowler is quite near, especially if they are breeding in a rather inaccessible spot where they are but seldom disturbed. At other times and places they are warier and not so easily approached. I have often seen two which had been putting their heads together caught in the noose at the same time, and at other times when the noose was being brought into position I have seen a bird take it in its bill and put it aside. The easiest time for snaring the Gannet is during the first week after the young are hatched. At this time they are so tamed by their parental affection that they can almost be taken by hand. Comparatively few, however, of either of the above species are captured in this way, and those which are taken are not much worth. There would be no real hardship to any one if this taking of them off the nest were prohibited altogether. The natives, who are naturally kind-hearted, are now becoming so enlightened that I am almost sure they would make no objection. The Puffin is the bird which is most easily and most generally caught in this way, and as

it breeds in holes the breeding birds generally escape. Hundreds of them are caught in this way for every one of any other species. There is more variety in their plumage than in that of any other species. Many of them are speckled and some almost white, and the natives account for it by saying that they are those which escape when half plucked.

The BLACK GUILLEMOT [*Uria grylle*] is of no value and not very numerous. In their habits these birds resemble the Cormorants. They lay one or two eggs in cracks of the rock just beyond the reach of the waves. Most of them leave as soon as the young are fledged.

Of the CORMORANTS [*Phalacrocorax*] there are two species. They are not very numerous, and they are of no value. They lay three or four eggs. The nest is not generally far from the sea, and is made of withered grass in dark, lonely caves and deep cracks of the rocks. On a stormy day they all go to the lee side of the island, flying very high as they change sides.

The OYSTER-CATCHER [*Hæmatopus ostralegus*] arrives in February. At first they go about in small flocks, but as the season advances pair. They lay three eggs, and as soon as the young are fully fledged depart. A few remain all winter, sometimes only one or two. They are at no time numerous.

KENMORE, PERTHSHIRE.

LEPIDOPTERA FROM THE EDINBURGH (OR FORTH) DISTRICT: FURTHER RECORDS.

By WILLIAM EVANS, F.R.S.E.

IN April 1897 a long series of records of Lepidoptera taken by me in this District was published in this Magazine (vol. vi. pp. 89-110). Since then I have added largely to my data, but the great majority of the additional material concerns species already recorded in the paper referred to. A considerable number of additional species, including six believed to be new to the Scottish list, have, however, been met with; and it is the purpose of the present communica-

tion to place these on record. Further localities for some of the others are at same time given. During 1904, Mr. W. Renton, formerly of Hawick, was living at Luffness Mill, and made some interesting captures which he very kindly placed at my service.

Among the more noteworthy occurrences of the period was the outburst—doubtless an immigration—of Humming-bird Hawk-moths (*Macroglossa stellatarum*) in June 1899, particulars of which have already been recorded by me in the "Annals" (1899, p. 184, and 1900 p. 54). In 1901 an immigration of *Sphinx convolvuli* evidently took place, and in September I obtained two fine larvæ on the railway embankment, west of Dunbar (see "Annals," 1901, p. 239, and 1902, p. 56). Four larvæ of the Death's-head (*Acherontia atropos*), which was also much in evidence about that time, were obtained the same autumn ("Ent. Mo. Mag. 1901, p. 298). In my former paper allusion was made to the scarcity nowadays of the Meadow-brown Butterfly (*Satyrus janira*) in the immediate vicinity of Edinburgh. I may therefore mention that, in August 1899, I caught one near Kirknewton, another in Arniston in August 1902, and in the same month several were seen at Hailes Quarry near Slateford. In the present series of records, the occurrence of the Irish *Argyritis tarquiniella* at Gullane is of special interest.

Specimens of most of the species (including all my "Micros") now recorded were kindly verified or named for me by the late Mr. C. G. Barrett.

The arrangement and nomenclature are, as before, in accordance with South's 1884 list. Species believed to be additions to the Scottish list are indicated by an asterisk.

Rhopalocera.

Argynnis selene.—Clackmannan Forest, half a dozen, 13th July 1901.

Vanessa atalanta.—Hybernated examples common in June 1900.

Thecla rubi.—Clackmannan Forest, a good many, 21st May 1901.

Sphinges.

Sphinx convolvuli.—One found alive at shop door, Morningside, Edinburgh, 3rd September 1904. See reference above to 1901 records.

Macroglossa fuciformis, South's list (*tityus*, L.).—Mr. Woodcock has shown me a specimen of the Narrow-bordered Bee Hawk-moth, which he found at rest outside of a window at Linkfield Cottage, Musselburgh, 26th July 1900.

Trochilium crabroniforme.—Seven moths and several larvæ taken on willows at Luffness and Aberlady, July 1898; larvæ from which moths reared, common in willows, near Kirknewton, April 1899, and Newpark 1901 (see my note in "Ent. Rec.," 1903, p. 23). Have also seen old borings in dead or aged willows at Braid Burn, Dreghorn, etc., and feel sure the insect has long been not uncommon in the district, but overlooked.

Bombyces.

Cossus ligniperda.—In March last, W. Renton showed me borings in old willows at Luffness from which he obtained Cossus larvæ in 1904, and he kindly gave me a moth he had reared.

Bombyx quercus, v. *callunæ*.—Larva, Cowie Moss, near Bannockburn, 18th June 1904; pupa, Kelphope, Lammermoors, October 1902.

Drepana lacertinaria, and *D. falcataria*.—Larvæ of both were obtained at Aberfoyle in September 1897.

Notodonta dictæoides.—Larvæ off birch, Aberfoyle, September 1897. *N. dromedarius*.—One moth, Dalmahoy Hill Moss, 6th July, 1903; larva, Oakley, Fife, August 1898; larvæ, common, Aberfoyle, September 1897. *N. ziczac*.—Eight larvæ off willows, Heriot, 29th July, 1897.

Phalera bucephala.—Larvæ off alder, Aberfoyle, September 1897.

Cymatophora or.—Larvæ off poplar, Luffness, 1904 (Renton).

Noctuæ.

Acronycta leporina.—Larvæ. off birch, Aberfoyle, September 1897.

A. tridens.—Larva, Luffness, 1904 (Renton).

A. menyanthidis.—Larva off willow, Aberfoyle, September 1897. *A. rumicis*.—Larvæ not uncommon on *Rumex acetosa*, Strathyre and Balquhidder, August and September 1902.

Apamea fibrosa, Hb. (= *leucostigma*, Staud. cat.).—One, among bog-myrtle, Aberfoyle, 13th September 1897. This is the specimen referred to in Barrett's "Lepid. Brit. Isles" (iv. 59), as taken by me "in the neighbourhood of Edinburgh."

Caradrina morpheus.—Luffness, 1904 (Renton).

Agrotis obelisca.—Aberdour, one, 1st September 1900; Kinneil, one, August 1901.

Noctua dahlii.—One, in firwood, Strathyre, September 1902.

Panolis piniperda.—The Forest, Clackmannan, larvæ off fir, July 1901.

Tæniocampa gracilis.—Aberfoyle, one taken, others seen, 1st June 1897 ("Annals," 1897, p. 258), several, end of April 1901. *T. pulverulenta.*—Larvæ, Aberfoyle, May 1896.

Xanthia flavago.—Many reared in 1902 from larvæ on willow catkins, Drumshoreland and Penicuik.

Cirrhædia xerampelina.—One on ash, Luffness Park, September 1904 (Renton).

Dianthæcia carpophaga.—Larvæ, Elie, July 1901.

Hecatera serena.—Several on tree-trunks, Luffness Park, in 1904 (Renton).

Aplecta prasina.—One, Balquhidder, August 1902.

Gonoptera libatrix.—Larvæ on willow, Balquhidder, August 1902.

Plusia festucæ.—Several, Morningside, July 1899; Aberlady, 1904.

GEOMETRÆ.

Epione apiciaria. — One at light, Kingshouse, Strathyre, 5th September 1902.

Ennomos alniaria, L. (*tiliaria*, D.L.).— ♂, at light, Kingshouse, Strathyre, 21st September 1902.

Gnophos obscuraria.—One, Aberdour, August 1900; Pettycur, a good many, July 1901.

Dasydia obfuscaria.—Hillside, near Balquhidder, one, 21st August 1902.

Venusia cambrica. — One, Luffness Woods, July 1904 (from W. Renton).

Acidalia fumata.—Clackmannan Forest, common, 13th July 1901.

Panagra petraria.—Clackmannan Forest, several, May 1900.

Anisopteryx æscularia.—Pass of Leny, two, 17th April 1900.

Larentia flavicinctata. — Common on rocks, Balquhidder hills, August 1902. *L. olivata.* — Several in ravine on hillside, Balquhidder, August 1902.

Eupithecia subfulvata.—One, Luffness, 15th July 1898; several, 1904. *E. helveticaria.*—Several larvæ off juniper, Kelphope, Lammermoors, 11th October 1902.

Lobophora carpinata.—Callander, common, April 1900.

Thera juniperata, v. scotica.—Common on juniper bushes, Kelphope, Lammermoor Hills, 11th October, 1902; also same

day, a few on junipers, Long Yester, Haddingtonshire. The day was cold but bright, and the moths took occasional weak flights when the sun was at its highest.

Cidaria miata.—Menstrie Glen, 15th October 1901.

Carsia paludata, v. *imbutata.*—Several, Aberfoyle, July 1900; common at Lochs Dow and Lurg, Cleish Hills, 11th August 1900.

Anaitis plagiata.—Balquhidder, common, August 1902.

Chesias spartiata.—Larvæ off broom, Balgeddie, near Loch Leven, June 1904.

Tanagra atrata.—Kirknewton and Newpark, common, July 1900; Arniston, several, August 1902; Castle Campbell, Dollar, a few, July 1901.

Pyralides.

Spilodes sticticalis.—Luffness Links, half a dozen, 27th July 1901 (see my note in "Annals," 1903, p. 53).

Hydrocampa nymphæata.—Pond near Drumshoreland, common, 4th July 1901; larvæ, common on pond at Bridge of Allan, June 1901. *H. stagnata.*—Inverkeithing, July 1898; Cullalo, common, June 1900.

Pterophori.

Platyptila ochrodactyla.—St. David's, Fife, common, July 1902. Var. *bertrami.*—Otterston, one, July 1895; Kirknewton, July 1899.

Crambi.

Crambus margaritellus.—Aberfoyle, abundant, July 1900; Dow Loch, Cleish Hills, common, August 1900.

Phycis fusca.—Forest Mill, Clackmannan, common, July 1901, and on railway bank near there, July 1903.

Tortrices.

Peronea rufana.—Aberfoyle, common, May 1897; one, September.

Penthina betulætana.—Balquhidder, one, August 1902. *P. marginana.*—Aberfoyle, 30th July 1900.

Sericoris littoralis (*littorana*).—Isle of May, several, 22nd July 1897. *S. rivulana.*—Aberfoyle, common, July 1900. *S. micana.*—Meadow at Heriot station, abundant, July 1897

Sciaphila chrysantheana.—Falkland, one, August 1895.

Capua favillaceana (*ochraceana*, D.L.).—Aberfoyle, 2nd June 1897.

Grapholitha nigromaculana.—Gullane Links and North Queensferry common, July 1897.

Pædisca bilunana.—Ravelrig Toll Moss, one on birch, 7th July 1903; Malleny, Balerno, several, 10th August 1904.

Coccyx argyrana.—Roslin glen, one on tree-trunk, 6th June 1900.

Stigmonota internana.—Blackford Hill, common, 24th June 1897.

Dicrorampha consortana.—North Queensferry, one, 28th June, 1900.

Pyrodes rheediella.—Locally common in June; Heriot, 1898; Aberlady, 1899; Edinburgh, 1900 (K. J. Morton); Dirleton, 1900; Gullane, 1901.

Tortricodes hyemana.—Between Dalhousie and Whitehill, common, 19th March 1898; Roslin Glen, common, March 1900.

TINEÆ.

Lemnatophila phryganella.—Gifford, 2 ♂s, 26th October 1901; Morton, near Edinburgh, ♂, 5th November 1901.

Tinea pallescentella.—In house, Morningside, July 1901.

Lampronia quadripunctella.—Pettycur, one, June 1895; Castle Campbell, July 1902.

Incurvaria pectinea.—Near Thornton, common, 24th May 1900; Newpark, May 1901.

Micropteryx purpurella.—Castle Campbell Glen, a few, April 1897; Hawthornden, common, 16th April 1898. *M. semipurpurella.* Castle Campbell, one, April 1897. *M. unimaculella.*—Callander, May 1894; Castle Campbell, common, April 1897; Culross, one, April 1901.

Nemophora swammerdamella.—Aberfoyle, a few, 3rd June 1897; Clackmannan Forest, common, 21st May 1901. *N. schwarziella.*—Aberfoyle, a good many, June 1897; Clackmannan Forest, common, May 1901; Polton, one, June 1901.

Adela viridella.—Clackmannan Forest, fairly common, 21st May 1901; Polton Woods, ♂, 29th May 1902. *A. fibulella.*—Larch grove, Balerno, June 1897; Markinch, common, June 1901; near Loch Fitty, common, 10th June 1905.

Swammerdamia spiniella.—Newbattle, one off sloe, 20th July 1901.

Prays curtisellus, v. *rustica.*—Winton, East Lothian, one, July 1895.

Cerostoma costella.—Aberfoyle, several, 11th September 1897.

**Depressaria propinquella.*—Luffness sandhills, common, September 1896. *D. angelicella.*—Reared from larvæ off *Angelica sylvestris*, near Gorebridge, July 1897. *D. flavella*, Hb. (=*liturella*,

D.L. *non* Hb.).—This is the *D. liturella* of my former list. *D. alstrœmeriana.*—Liberton, several, 31st March, 1903; Bo'ness, April 1900 (R. Godfrey).

Gelechia (*Bryotropha*) *desertella.*—Luffness Links, one, August 1896; Isle of May and North Queensferry, July 1897. *G. confinis.*—One, Morningside, May 1900.

Lita (*Gelechia*) *obsoletella* (considered by some only a variety of *atriplicella*).—Bass Rock, common among *Atriplex*, 19th June 1901. *L. æthiops.*—Fir wood near Midcalder, 5th May 1900 ("Ent. Mo. Mag." 1900, p. 159). *L. marmorea.*—Isle of May, July 1897.

Teleia proximella.—Aberfoyle, June 1897; Bridge-of-Allan, June, and Thornton, July 1901, off birch; Cowie Moss, July 1903. *T. sequax.*—North Queensferry, June 1900. *T. dodecella.*—Forest Mill, July 1901.

**Argyritis tarquiniella* (probably not specifically distinct from *pictella*).—Common on bare rocky spots, Gullane Hill, Haddingtonshire, 5th and 21st July 1898. Determined by Mr. Barrett. Seems to be recorded only from E. Coast of Ireland.

**Nannodia hermannella.*—Musselburgh, one off herbage by side of wall, 11th July 1903. A little gem.

Monochroa tenebrella.—Pettycur, Fife, one, June 1897.

Pleurota bicostella.—Cowie (Bannockburn), Moss and Brucefield Moss, July 1903.

Dasycera sulphurella.—Blackford Hill, June 1899; Gullane, June 1901; etc.

Pancalia leuwenhoekella.—One, Alva, 3rd May 1897; Largo Links, a good many, 26th May 1900.

Glyphipteryx thrasonella.—North Berwick and North Queensferry, July 1897; Aberfoyle, July 1900; etc.

Argyresthia conjugella.—Larch Grove, Balerno, one, June 1897. **A. semifusca.*—Near Kirknewton, a good many off rowan, May 1895.

Cedestis gysselinella.—Clackmannan Forest, common on Scotch fir, 13th July 1901; Cowie Moss, 4th July 1903.

Gracilaria tringipennella.—Blairadam, common in meadow, June 1901. *G. auroguttella.*—North Queensferry, several, July 1897.

Ornix scoticella.—Larch Grove, Balerno, common on rowan, June 1897.

**Coleophora solitariella.*—Pupa cases common on stones, etc. among *Silene maritima* on the Bass Rock, June 1899 and 1901; moths emerged in July. **C. mæniacella*, Sta. (*muehligiella* of Meyrick's Handbook?)—Reared from cases off wooden fence, Morningside, October 1900 and 1902. Determined by Mr. Barrett.

Laverna miscella.—On grassy bank, Aberdour, a good many, 16th August 1900. *L. lacteella.*—North Queensferry, June 1900.

Chrysoclysta schrankella.—Luffness Links, a few, on iris, July 1898.

Elachista kilmunella.—Fala Moor, common, 17th July, 1897. *E. zonariella.*—Heriot, one, July 1897. *E. luticomella.*—Polton, June, 1901.

Lithocolletis ulmifoliella.—Aberfoyle, May 1897; Corstorphine Hill, May 1901. *L. alnifoliella.*—Dollar, 1st May 1897; Dalmahoy, common, May 1898. *L. messaniella.*—Blackford Road, Edinburgh, 1900 (K. J. Morton); near Alloa, May 1901.

Lyonetia clerckella.—Bridge-of-Allan, May 1900; Culross, April 1901; Balerno, May 1905.

Cemiostoma scitella.—Morningside, several, June 1898.

Opostega crepusculella.—Marlpit, Davidson's Mains, a few, August 1898.

Nepticula myrtillella.—Bavelaw Wood, on bilberry, 29th May, 1900.

THE TARDIGRADA OF THE FORTH VALLEY.

By James Murray.

This short list of Tardigrada, found in the valley of the Forth, is entirely drawn up from material collected by Mr. Wm. Evans, and sent to me for examination. The localities where the collections were made are all in the lower part of the Forth valley, and at no great distance from Edinburgh. About a dozen forms were observed. The number of species cannot be definitely stated, as several of the forms seen were not in condition to be determined with certainty. It is also uncertain how many of the species of Tardigrada which have been described can really claim to be good species. Owing to the insufficiency of the earlier descriptions, and our ignorance of the life-histories of all but a few species, it is likely to prove that the same animal, at different

stages of growth, has been described several times over under different names. The study of the Tardigrada has been greatly neglected till quite recently. The only modern systematic works of any extent being Plate's monographic study (4), 1889, and Richter's numerous papers. There can be no doubt that with further work the list of Tardigrada of the Forth valley could be greatly extended. They are to be found, it may be mentioned, chiefly among damp moss, and on such water plants as *Elodea canadensis*.

Figures in brackets in the text refer to the short bibliographical list at the end.

LIST OF SPECIES.

Genus Echiniscus.

Besides the five species included in the list, several others were seen, but as they were immature they could not be named.

Echiniscus arctomys, Ehr. (3).—Nether Habbie's Howe, Pentland Hills, March 1905, one example.

E. mutabilis, Murray (7).—Cobbinshaw Moor, April 1905, type, two eggs.

E. wendti, Richters (6).—Nether Habbie's Howe, Pentland Hills, March 1905, several.

E. granulatus, Doy. (2).—In moss (*Leucodon*) off tree, Rosebery, Midlothian, February 1905; the one example found differs from the type of the species in lacking the little spine at the junction of the tail-piece with the lumbar plate, but being otherwise typical I see no reason for separating it.

E. spitzbergensis, Scourfield (5).—In moss, Howgate, near Penicuik, 30th March 1905. This example agrees with Scourfield's description and figure in the number and arrangement of the plates and spines. The second pair of dorsal spines are, however, much longer. The texture of the plates offers a peculiarity, also found in all the Loch Morar examples; the pattern appears to consist of large rings with open (perforate) centres, instead of the coarse granules seen by Scourfield. I believe these apparent rings arise by some change of the granules. Living examples have not yet been seen in Scotland.

Genus Macrobiotus.

Only one species of the genus could be named. Cast skins of one or two other species, containing eggs, were found, but without seeing the teeth and pharynx they could not be identified.

Macrobiotus hufelandi, C. Sch. (1).—Frequent, Duddingston Loch (March 1905), Lochgelly, Midcalder, Roslin.

Genus Milnesium.

The only known species of the genus (since *M. alpigenum*, Ehr., has been shown by Richters to be identical with *M. tardigradum*) occurred in one collection only.

Milnesium tardigradum, Doy. (2).—Boltonmoor, East Lothian, April 1905, abundant.

Genus Diphascon.

This genus is well represented in the Forth collections. I only know of three species of the genus previously described. Three species occurred in Mr. Evans' collections, and two of these were new, the third being the type species, *D. chilense*.

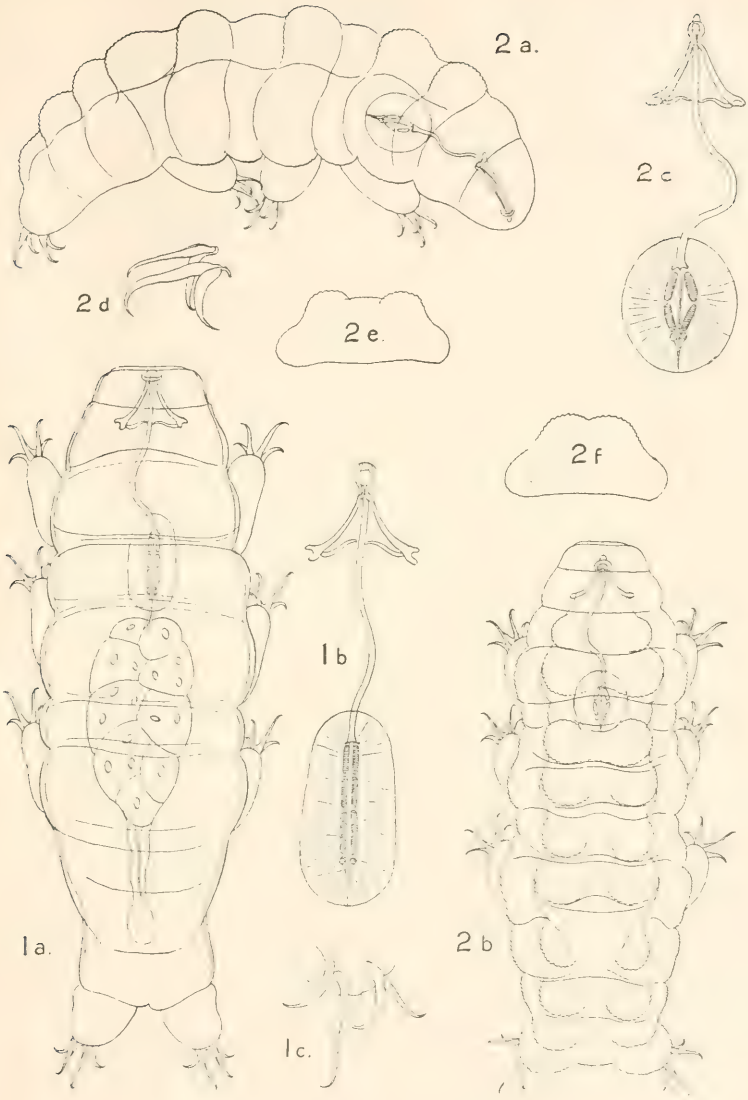
Key to the Species of Diphascon.

(A) Pharynx nearly round, gullet slender.
 (*a*) Skin smooth, rods in pharynx 4 or 5 in each row. *D. chilense* (4).
 (*b*) Skin papillose, embossed, rods in pharynx 3. *D. bullatum*, n.sp.

(B) Pharynx narrow, gullet wide or slender.
 (*c*) Gullet slender, pharyngeal thickenings 4. *D. scoticum*, n.sp.
 (*d*) Gullet wide, pharyngeal thickenings 3. *D. spitzbergense* (6).
 (*e*) Gullet very wide and short, pharyngeal thickenings 2. *D. angustatum* (7).

Diphascon chilense, Plate (4).—Near Aberdour, Fife, March 1905, one example.

D. scoticum, n.sp. Figures 1*a* to 1*c*. *Specific characters.*—Large, hyaline. Teeth curved, widely divergent, with bearers. Gullet long, slender, flexible portion about as long as the pharynx. Pharynx narrow, twice as long as broad, slightly narrower in front; thickenings four in each row, the first two elongate rods of equal size, the third a similar but longer rod, the fourth a small nut. Claws, a long and a short in each pair; the long claw of one pair much longer than that of the other. Like *D. angustatum* in the narrow pharynx, it differs in having twice as many thickenings in each row and in the long slender gullet. The general form is also different, lacking the decided anterior narrowing of *D. angustatum*. Size, up to $\frac{1}{66}$ inch = 378μ. Otterston, near Aberdour, Fife, March 1905 (W. Evans); and in moss, Boltonmoor, East Lothian, April. Since found in several localities outside of the Forth Valley.



Explanation of Figures.

1*a*. *Diphascon scoticum*, dorsal view.
1*b*. The same, teeth, gullet, and pharynx.
1*c*. The same, claws.
2*a*. *Diphascon bullatum*, lateral view.
2*b*. The same, dorsal view.
2*c*. The same, teeth, gullet, and pharynx.
2*d*. The same, claws.
2*e*. The same, optical section about third legs.
2*f*. The same, optical section about first legs.

D. bullatum, n.sp. Figures *2a* to *2f*. *Specific characters.*—Short, broad. Body in section somewhat trilobate, two narrow lateral flanges separated from the median dorsal mass, the dorsal portion bearing at each apparent segment of the body a pair of rounded low prominences; on the anterior part of the body the processes of each pair touch, behind they are widely separated. Skin all minutely papillose, papillæ larger on the dorsal bosses. Teeth curved, divergent, with bearers; gullet long, slender, the flexible portion longer than the pharynx. Pharynx shortly elliptical, nearly as broad as long; three thickenings in each row, two equal narrow rods and one small nut (at posterior end). Claws, one of each pair longer than the other, and that of one pair much longer. Resembling *D. chilense* in the nearly round pharynx and slender gullet, it differs in having fewer thickenings in each row, in the papillose skin, and the two rows of bosses on the back. The legs are short, and the last pair unusually divergent. In moss, south shore of Loch Leven, 8th April 1905 (W. Evans), two examples. Size $\frac{1}{84}$ inch.

Works referred to.

(1) Schultze, C. A. S., 'Macrobiotus hufelandi,' "Isis" of Oken, 1834, p. 708.
(2) Doyère, 'Sur les Tardigrades,' "Ann. Sc. Nat." sér. 2, t. 17, 1840, p. 282.
(3) Ehrenberg, "Mikrogeologie, 1854," Atlas, Pl. 35 B.
(4) Plate, L. H., 'Naturgeschichte der Tardigraden,' "Zool. Jahrb." Bd. III. Morph. Abt., 1889, p. 537.
(5) Scourfield, D. A., 'Non-marine Fauna of Spitzbergen,' "Proc. Zool. Soc. London," 1897, p. 791.
(6) Richters, F., "Fauna Arctica," Bd. III., 1904, pp. 499 and 506.
(7) Murray, J., 'Tardigrada of the Scottish Lochs,' "Trans. Roy. Soc. Edin.," vol. xli., 1905, p. 677.

CONTRIBUTION TO A FLORA OF THE OUTER HEBRIDES. No. 3.[1]

By Arthur Bennett, F.L.S.

The following records, notes, etc., are such as have accumulated since 1895. Dr. Shoolbred's excellent papers on the Flora appeared in the "Journal of Botany," 1895, pp. 237-249, and 1899, pp. 478-481.

[1] No. 1 "Ann. Scot. Nat. Hist.," 1892, pp. 56-64; No. 2 *l.c.*, 1895, pp. 240-247.

His collections show that much yet remains to be done in the islands; and it would seem by Mr. W. S. Duncan's researches that the alpine element (noted as so poor by Babington in 1844) is richer than has been supposed.

THALICTRUM ALPINUM, *L.*—"Can be gathered in South Harris with one foot on heaps of seaweed on the shore." W. S. Duncan.

RANUNCULUS HEDERACEUS, *L.*—Stornoway and near Loch Boisdale in South Uist. Duncan.

R. FLAMMULA, *L.*, *forma* MINIMA, A. Benn.—Dry moorland by the coast, on the west side of North Uist. Dr. Shoolbred, *sp.*

SUBULARIA AQUATICA, *L.*—South Harris, M'Gillivray. Two stations in North Harris (Duncan, *sp.*). On record for Shetland (Beeby, *sp.*) and Caithness (Henderson), but not for the Orkneys.

VIOLA ERICETORUM, *Schrader*, *forma.*—Scarp, 1896, W. S. Duncan, *sp.* "I don't think this is *ericetorum*; I think rather *ericetorum* × *Riviniana*; but for absolute certainty it would be necessary to know whether sterile or not." Mr. Beeby *in litt.*

V. LUTEA, *Huds.*—Sandhills, Kirkibost Island, 1898, Shoolbred, *sp.*; looks like *Symei*, Baker. Found in Sutherland (Grant, *sp.*) and Caithness (Grant, *sp.*), but not in Orkney or Shetland.

V. CURTISII, *Forster.*—Scarp, Hushinish; North Harris, Duncan, *sp.* The Lancashire *V. Curtisii* was named *V. sabulosa*, Bor.,[1] by M. Lloyd, of Nantes, France. Lange in "Danske Fl." p. 654, 1887, refers Boreau's plant to *V. tricolor*, var. *arenaria*, Sonder, "Fl. Hamb." p. 137, 1851; and Nyman puts *Curtisii* as a variety of *V. lutea*, Huds. Of course Forster's name precedes all these.

Among these Hebridean Violas there are three distinct forms, one from Scarp with large flowers like *lutea*, the intermediate (Benbecula), and the North Uist, the last with the growth of Anglesea specimens, but larger flowers, and also larger than the Devon *Curtisii*. In its mode of growth the Scarp plant is as diffuse as the Devon plant, but the flowers are three times the size. The North Uist and Barra specimens grow in compact masses, and the flowers are larger than in the Devon plant. In boreal plants the flowers are often large, at the expense of the foliage. So far as leaves go, they are of all sizes, breadth, etc., between the narrowest (Lythan Sandhills), through the next (Braunton Burrows), to the wide leaves of Irish specimens. All these forms are wholly yellow-flowered.

[1] 'Notes et obs. quel. pl. de France,' 3; "Bull. soc. indust. d'Angers," 1846-53.

I have seen no Hebridean specimens of the plants called var. *Mackaii*, though it grows together with the type in Lancashire, and occurs in Scotland in East Sutherland (J. Grant, *sp.*), West Sutherland (Hanbury, *sp.*), also in the Isle of Eigg! and Moidart! Taking the series of *Curtisii* forms from Caithness to Devon it seems difficult (if not impossible?) to make any separation of forms. The larger set of forms when placed together are no more different than the smaller ones placed together; each and all can be sorted by the eye, but when characters are sought they fail.

FUMARIA OFFICINALIS, *L.*—Isle of Barra, 1888. A. Somerville, *sp.*

F. CAPREOLATA, *L.* (*sensu stricto*).—Potato field, Scarp. W. S. Duncan, *sp.*

F. CONFUSA, *Jord.*—Scarp, W. S. Duncan, *sp.*; South Uist, A. Somerville, *sp.* Sandy meadows near Ballelock, North Uist, Dr. Shoolbred, *sp.* The above Fumarias are named according to Mr. Pugsley's paper, but not by him.

CRAMBE MARITIMA, *L.*—Head of Loch Maddy, North Uist, on sand, June 1848. D. C. Burlingham.

"Plants, Sea-Kale, *Viola lutea*, *Glaux maritima*, *Arenaria peploides*, Scurvy-grass." The above is an extract from the note-book of Mr. D. C. Burlingham, quoted by Dr. C. B. Plowright in an obituary notice of him in "Trans. Norf. and Norwich Nat. Society," vol. vii. p. 414, 1902. Mr. Burlingham was a good botanist and ornithologist. He was at Tarbert, Obbe, Balallan, Loch Erisort, etc. By the kindness of Dr. Plowright I have ascertained that there is no specimen in his herbarium. In Scotland the records take it to Islay, one of the South Hebrides islands, and to Forfarshire on the east coast. In Sweden it occurs in Skåne to Upland, in South Norway (about 59° N. lat.). It used to occur in "Nylandia" in Finland, and in Aböensis in the south of that country. That it is a species gradually becoming rarer on our coasts, seems certain by the records, etc., of the last fifty years.

SILENE ACAULIS, *L.*—Abundant on the western part of the North Harris range of mountains, W. S. Duncan. Ceartaval at 1800 feet, Duncan, *sp.* Shetland at sea-coast, Watson, 400-800 feet, Tate. Orkney, 150 feet, Syme. West Sutherland, 600-800 feet, Marshall. Perth, 1200 feet, B. White. North England, 1200-1800 feet, Baker. "On the mountain on the Isle of Rume called Ascheval, where I found it growing about 1500 to 1700 feet high, July 21, 1764," Rev. J. Walker,[1] *sp.* Isle of Mull, south side of the entrance of Loch-na-Keal, at

[1] Author of "Essays on Natural History," 1812. See "Biog. Index of Brit. and Irish Botanists," 175, 1893.

about 20 feet above the sea, on the cliffs of Gribon, "where in storms the spray may reach it," Mrs. Crichton to Mr. A. Somerville. In Arctic Norway it grows at various altitudes from 1000 to 4050 feet, and blooms from the 8th of June to 12th of September, extending up to 71° 11′ N. lat.

Arenaria serpyllifolia, *L.*, var. macrocarpa, *Lloyd.*—"Fl. Loire-Inf.," 1844 = *A. Lloydii*, Jordan. Sandy meadow, Balelone, North Uist, Dr. Shoolbred!

Drosera anglica, *Huds.*—Near Loch Arynuish and Lainvagha in Lewis, Gorrie. Queried for Shetland in "Top. Bot.," 1883, but found by Mr. Beeby (*sp.*) in 1889.

Geranium Robertianum, *L.*—Among large stones, foot of cliffs, 2 miles east of Awhuinnsuidh, W. S. Duncan. Shetland, Beeby, 1890; thus on record for all the counties of Scotland.

Radiola linoides, *Roth.*—Eye Peninsula, Lewis, Gibson, *sp.*

Trifolium pratense, *L.*, var. maritima, *Marss.*—Sandhills, Kirkibost Island, North Uist, Dr. Shoolbred.

Vicia sylvatica, *L.*, *forma* subrotundata, *mihi.*—Rocky coast of Scarp, off Harris, in the north of the island, where it grows in some quantity, festooning the steep cliffs in places, W. S. Duncan, *sp.*

Contrasted with specimens from Obbe, North Harris (W. S. Duncan, *sp.*), the Scarp plant looks very different, with its small subrotund leaflets, giving the plant more the look of some forms of *V. sepium*, *L.* From the mainland examples the specimens differ in the less portion of the peduncle occupied by the flowers (⅓ only as against ½ usually), the calyces are much more strongly veined, and the teeth longer and more attenuate.

In Caithness examples I find the majority of the flowers with well-defined holes at the base of the calyces, but I have been unable to find any cause. Mr. Scott-Elliot gives two humble bees, *Bombus muscorum* and *B. hortorum*,[1] as visiting this species, but does not mention how they act with regard to the flowers.

V. Cracca, *L.*, var. argentea, *Meyer*, in "Hann. Mag." xxii., 1824, p. 171 = *V. incana*, Thuill. "Fl. Paris," 1799, p. 367. Kirkibost Island, North Uist, Dr. Shoolbred, *sp.*

Lathyrus pratensis, *L.*—Obbe, Duncan, *sp.*

Rubus saxatilis, *L.*—Scarp, North, South Harris, W. S. Duncan.

Alchemilla vulgaris, *L.*, var. δ, alpestris, Pohl. "Tent. Fl. Bohem." p. 152, 1810 = *A. alpestris*, Schmidt, "Fl. Bohem." 1 cent. 3, p. 88, 1794.—Obbe in Harris, W. S. Duncan, *sp.*

[1] "Flora of Dumfriesshire," p. 50, 1896.

The only form I have as yet seen from the Outer Hebrides. Dr. Shoolbred records *A. vulgaris*, L., from North and South Harris, but I have not seen specimens.

A. ALPINA, *L.*—On Ceartaval at 1800 feet, Duncan, *sp.* "Highlands at 450 feet," Watson, "Comp. Cyb. Brit." p. 166, 1870; "300 feet in Westerness," Macvicar, "Trans. Bot. Soc. Edin." p. 179, 1899. Not recorded for Orkney—a curious absentee.

A. ARVENSIS, *L.*—Fields in Scarp, W. S. Duncan.

SAXIFRAGA OPPOSITIFOLIA, *L.*—Harris mountains in the east, middle, and west. North gully just behind stream, Ulladale, at 600 feet. On Husival More (1603 feet), but a short way above the base with *Oxyria reniformis*. 700 feet in Westerness, Macvicar.

This saxifrage remains 151 days in flower in Norway.[1]

S. STELLARIS, *L.*—At 400 feet in Glen Ulladale, W. S. Duncan. 700 feet in Westerness, Macvicar. 450 feet in Wales, Watson, "Comp. Cyb. Brit." p. 180, 1870. Less than 600 feet in W. York, Lees, "Fl. W. York." p. 788, 1888.

CHRYSOSPLENIUM OPPOSITIFOLIUM, *L.*—W. Tarbert, Harris, W. S. Duncan, *sp.* Not recorded from Shetland.

CAUCALIS ANTHRISCUS, *Huds.*—Harris, W. S. Duncan. In E. Sutherland, but not in W. Sutherland, Orkney, or Shetland.

VALERIANA OFFICINALIS, *L.*—North and South Harris, W. S. Duncan.

CARDUUS HETEROPHYLLUS, *L.*—Obbe, Duncan, *sp.* This is the ordinary form of the species, with undivided finely dentate leaves. The form with the leaves much cut into segments[2] seems rare in Britain. There is a sp. in the "Brit. Mus. Herb." (Forster's herb) from the Isle of Mull; and I have it from Inverness (W. A. Nicholson, *sp.*), and a very extreme form (or a hybrid with lanceolatus?) from Forfar (E. S. Marshall, *sp.*). In this the anthodes (5) are agglomerated at the apex of the stem, which is leafy up to the lowest anthode, and the leaves are all cut into narrow segments to within two lines of the midrib. Dr. Williams ("Prod. Fl. Brit." 2, p. 50, 1901) says "ascends to 500 metres," but it certainly grows up to 2500 feet in Perthshire.[3]

ACHILLEA MILLEFOLIUM, *L.*—Some of the Hebridean specimens of this seem as much referable to the var. *lanata*, Koch, as to *alpestris*. Koch refers the *A. Seidleri*, Presl., to *alpestris*

[1] Norman, "Norges Ark. Fl." ii. p. 300, 1895.
[2] Var. *laciniosum*, Norrl. (sub. Cirsium), "Herb. Mus. Fenn." 103, 1889.
[3] "Flora Perth." p. 190, 1898.

"secund spec. Opizianum"; assuming this to be correct the Hebridean specimens will hardly agree in some parts, while in others they do, as in the involucres. Hartmann, "Skand Fl." 1st ed. p. 319, 1820, has a var. *villosum*; in his 11th ed. he gives Koch's *lanata*, with no mention of his former variety; but I cannot see how they differ. If they are the same, Hartmann's name was given 17 years before Koch's. Comparing these specimens with Shetland (var. *alpestris*) and Caithness specimens, I believe the Hebridean plant to be var. *villosum*, Hartmann, and not var. *alpestris*.

Senecio Jacobæa, *L.*, var. discoideus (*Koch*).—Scarp, near houses, W. S. Duncan, *sp.*

Saussurea alpina, *DC.*—Plentiful at 400 feet in Glen Ulladale, Harris, W. S. Duncan, *sp.*; West Sutherland at 800 feet (Miller); Caithness about 50 feet (cliffs) (Horn); Shetland, 800-1500 feet (Tate).

Leontodon autumnalis, *L.*, var. sordida, *Bab.* (*Oporinia autumnalis*, Don, var. *sordidus*, Bab., "Man. Brit. Bot." 2nd ed. p. 189, 1847).—A large gross form of the plant, for which I can find no earlier continental name. One of Opiz's Seznam names (1852) may apply to it, but it is a name only, Scarp.

Lapsana communis, *L.*—Scarp, W. S. Duncan.

Hieracium rivale, *F. J. Hanb.*—Cliffs, South Ben Lee, North Uist, Dr. Shoolbred.

H. sinuans, *F. J. Hanb.*—Barra, Somerville, "Monog. Brit. Hierac." pt. 7, 56, 1896.

H. farrense, *F. J. Hanb.*—Rocks in Scarp, 1891, W. S. Duncan, *sp.*

H. auratum, *Fr.*—Shore banks, mouth of harbour, Scarp, W. S. Duncan, *sp.*

H. rigidum, *Hartm.*, var.—Ben Eaval, North Uist.

H. reticulatum, *Lindeb.*—River Creed, Stornoway, Col. Rimington.

H. bifidum, *Kit.*—North Uist, Dr. Shoolbred.

"H. iricum abnormal," *F. J. Hanbury in litt.*—Scarp!

Lobelia Dortmanna, *L.*—Loch Arynuish, Gorrie.

Arctostaphylos Uva-ursi, *Spreng.*—Obbe, Duncan, *sp.* This, with East Sutherland (Grant, *sp.*), completes the northern distribution in Scotland.

Vaccinium Vitis-idæa, *L.*—Plateau upwards of 1000 feet (Strome, Ulladale, at 1398 ft.), near Ullaval, North Harris, W. S. Duncan, *sp.*

Veronica serpyllifolia, *L.*—Scarp, W. S. Duncan.

V. scutellata, *L.*—Obbe, Harris, W. S. Duncan.

Digitalis purpurea, *L.*—Tarbert, Harris, W. S. Duncan. Wanting only in Shetland to complete its comital distribution in Scotland.

Melampyrum pratense, *L.*, var. purpureum, *C. J. Hartmann*, "Svensk och Norsk. Excursions Flora," 1st ed., 1846.—On Ullaval, above 1000 feet, plentiful, W. S. Duncan, *sp.* A small, pretty form of the species, recorded in Sweden from Skåne to Gottland. As found on Ullaval it is 2 to 3 inches high when in full flower, of a deep purple, with the seed-leaves still attached.

Samolus Valerandi, *L.*—Obbe, Harris, W. S. Duncan, *sp.*

Myosotis repens, *Don.*—By small lakelet on south side of Glen of Obbe, S. Harris, W. S. Duncan, *sp.*

†Mentha viridis, *L.*—Garden escape, Scarp, W. S. Duncan, *sp.*

Stachys palustris, *L.*—In several fields in Scarp it is so plentiful as to greatly injure the crop, Duncan *in litt.*

Ajuga pyramidalis, *L.*—On Ronaval (1502 feet), South Harris, W. Macgillivray, in "Sys. Arr. Brit. Pl." p. 243, 1840.

Lamium hybridum, *Vill.*—Frequent in fields in Scarp, Duncan.

Utricularia minor, *L.*—North of West Loch Tarbert, Harris, Duncan, *sp.*

Atriplex patula, *L.*, var. serrata, *Syme.*—Arnisch, near Stornoway, W. J. Gibson, *sp.*

Oxyria digyna, *Hill.*—Glen Ulladale, at 400 feet, W. S. Duncan.

Polygonum hydropiper, *L.*—Obbe, Harris, W. S. Duncan. Wanting in Orkney and Shetland.

P. Raii, *Bab.*—North Harris, W. S. Duncan, *sp.*, Hushinish. Occurs in Mid (Macvicar, *sp.*) and South Ebudes (A. Somerville, *sp.*), and said to be common in Shetland (Edmonston's "Flora"), but I know of no confirmation of this. Rare in Sweden and South and North Norway; in Finland occurs at Hanjo, and in eight localities in the "Isthmus karelicus," with *Cakile* and *Salsola*. European authors spell the name *Rayi*, *Rajii*, and *Raii*; the last is what Babington has in "Eng. Bot. Supp." t. 2805 (Aug. 1, 1837), and in the 1st ed. of his "Manual," p. 259, 1843. Hooker referred this to *P. Robertii*, Loisel, but according to Dr. Meisner this is made up of specimens of *P. aviculare*, L., *P. littorale*, Link., and *P. Raii*, Bab. Grenier and Godron ("Fl. Fr." iii. p. 82, 1885) refer it to *P. littorale*, Link., *var. β latifolium*, G. et G., and say, "Bab. Prim. Fl. Sarn. 87, et exsicc! Eng. Bot. Supp. t. 2805."

Rumex obtusifolius, *L.*—Garra-na-hina, Lewis, Gorrie.

Salix herbacea, *L.*—On Ceartaval at 800 feet. On all the hills of North and South Harris; also in Scarp from 750 feet to 1011 feet, the highest point in the island, W. S. Duncan, *sp.*; 680 to 710 feet on Fair Isle, Shetland, E. Straker, *sp.*; 600 feet, St. Kilda, Barrington, *sp.*; Shetland, 938 to 1470 feet, Tate; Donegal, Ireland, at 870 feet, Hart. The altitudes of the Fair Isle and St. Kilda specimens are the lowest recorded in Great Britain.

Listera ovata, *R. Br.*—Bare pastures in Scarp, North Harris, Duncan.

Orchis ericetorum, *Linton.*—Isle of Barra, 1888, A. Somerville, *sp.*

Habenaria viridis, *R. Br.*—Kirkibost Island, North Uist, Dr. Shoolbred! On Ceartaval to 1600 feet, W. S. Duncan, *sp.*

Ruppia rostellata, *Koch.*—North Harris, Duncan.

Juncus trifidus, *L.*—Ullaval, at 1500 feet; Ceartaval, on the top at 1807 feet plentifully; North Harris, W. S. Dnncan, *sp.*

Luzula spicata, *DC.*—With the last on Ceartaval, W. S. Duncan, *sp.*

Potamogeton crispus, *L.*—Small loch on Baleshare Is., Shoolbred, *sp.* Shetland, an error? Not an Arctic species; rare in Finland and South Norway. Reported for Iceland by Lindsay and Gliemann, but I have seen no specimens; and Groenlund ("Islands Flora," 1888) and Stefansson ("Flora Islands," 1901) do not give it.

Scirpus multicaulis, *Sm.*—N. Harris, opposite Scarp, W. S. Duncan, *sp.*

S. lacustris, *L.*—Obbe, Duncan.

S. rufus, *Schrad.*—Obbe, Duncan.

Carex arenaria, *L.*—Scarp, W. S. Duncan.

C. pauciflora, *Light.*—North of West Loch Tarbert; Obbe, Harris; heathy ground near Castle of Auchinasuidh, North Harris, at 150 feet, W. S. Duncan, *sp.*; in West Sutherland, at 300-400 feet, C. S. Marshall, *sp.*; Tyne Province, England, at 450 feet, J. Thomson, *sp.*; Ireland, at 1000 feet, Lett, *sp.*

I have no note of the height it occurs at on Morven, Caithness (Hanbury, *sp.*). It is reported from Orkney (New List in "Scot. Nat." 1883, p. 73), but not from Shetland.

C. teretiuscula, *Good.*—Balranald Marshes, Dr. Shoolbred, *sp.* In West Sutherland and Caithness, but not on record for Orkney or Shetland.

C. PALLESCENS, *L.*—Obbe, Harris, Duncan.

C. SPICULOSA, *Fr.*, var. HEBRIDENSIS, *Ar. Benn.*—This grows with *Schœnus nigricans*, *Molinia*, *Rhynchospora alba*, Heath, etc.

Messrs. Groves remark,[1] "It seems to lack the asperous prolongation of the midrib to the glume characteristic of that species." This is the reason why I called it a variety, and to this Dr. Almquist agreed. Being probably a hybrid, and with the same derivation as *spiculosa*, it seemed better to do that than to give it a name as a species.

C. LIMOSA, *L.* (seg.).—North of West Loch Tarbert, W. S. Duncan; Caithness, but not on record for Orkney or Shetland.

C. RIGIDA, *Good.*—With *Salix herbacea* at 800 feet and upwards in Scarp, W. S. Duncan, *sp.*; at 1650 feet in Cheviot and Durham, Tate and Baker; 1440 feet in Sutherland, Watson; 800-1400 feet in Shetland, Tate; 1000 feet in Donegal, Ireland, Hart, *sp.* So far as I know these are the lowest altitudes at which *C. rigida* has occurred in the British Isles.

[C. PARADOXA, *Willd.*—Should occur in Scotland. It extends in Sweden north to Östersunds Län, but is not on record for Swedish Lapland. In North and South Norway, and in Finland, up to 66° North Lat.]

C. FLACCA, *Schreb.*, var. ACUMINATA (= *C. acuminata*, Willd., Sp. iv. p. 300, 1805; *C. glauca*, Murr., var. *serrulata*, "Biv. stirp. rar." iv. p. 9, 1806; *C. glauca*, Murray, "Prod. fl. goet.," has no existence, *teste* Mr. C. B. Clarke).—North Harris, W. S. Duncan, *sp.*

PHRAGMITES COMMUNIS, *Trin.*—South coast of Scarp, W. S. Duncan.

†AVENA FATUA, *L.*—About potato and corn fields in Scarp, W. S. Duncan.

DESCHAMPSIA FLEXUOSA, *Trin.*, var. MONTANA, *Hook, fil.*—Oreval and Ullaval, North Harris, W. S. Duncan, *sp.*

[D. DISCOLOR, *Roem.* and *Sch.*—Should occur in the Outer Hebrides. It occurs in West Sutherland (Linton, *sp.*) and in Shetland (Beeby, *sp.*).]

CATABROSA AQUATICA, *Beauv.*, var. LITTORALIS, *Parn.*—Is this the same as var. *β uniflora*, Gray, "Nat. An. Brit. Pl." p. 133, 1821, and var. *β subtilis*, Hook, "Brit. Fl." p. 36, 1838? Scarp, W. S. Duncan, *sp.*

FESTUCA RUBRA, *L.*, GENUINA, sub-var. ARENARIA, *Hackel.*—Ullaval, North Harris, W. S. Duncan, *sp.* *F. rubra*, L.—The only heights given by Watson for this species in "Comp. Cyb.

[1] Babington's "Man. Brit. Bot." 9th ed. p. 462, 1904.

Brit." p. 400, are: Tyne, to 250 yards?; Humber, to 200 yards. The following may be quoted: 1500 feet, West Yorkshire, Lees; 2600 feet, Outer Hebrides, Babington; 3500 feet, Mid Perth, Macvicar; "All levels," F. B. White, "Fl. Perth"; "Coast only," Baker in "Lake Flora"; Ireland, County Down to 1600 feet, Stewart and Praeger.

AGROPYRUM ACUTUM, *R. et S.*—Scarp, W. S. Duncan, *sp.*, *teste* Hackel. The distribution in the North of Scotland of *A. acutum* and *A. pungens* is very uncertain. Some specimens seem to differ from both, and yet not to agree with *A. junceum*.

PHEGOPTERIS DRYOPTERIS, *Fée.*—Obbe, North Harris; Scarp, 1899, one very luxuriant clump, W. S. Duncan, *sp.*; not in Orkney, whence *P. polypodioides*, Fée, is recorded.

CRYPTOGRAMMA CRISPA, *R. Br.*—Middle of the North Harris range, W. S. Duncan.

OSMUNDA REGALIS, *L.*—Loch Arynuish and Larvagha, Gorrie. "In good plenty in Shetland," Beeby, 20/8/1901.

OPHIOGLOSSUM VULGATUM, *L.*—Scarp, W. S. Duncan; var. *polyphyllum*, Braun. Scarp, W. S. Duncan, *sp.*; also on St. Kilda, Barrington!

LYCOPODIUM ALPINUM, *L.*—In North Harris, but rather scarce, W. S. Duncan.

(A remarkable absentee from the Outer Hebrides is *L. clavatum*, L. It surely must occur; but I can find no record of it. It occurs in Sutherland, Caithness, Orkney, and Shetland.)

EQUISETUM SYLVATICUM, *L.*—Pretty frequent in the North of Scarp, W. S. Duncan, *sp.*

ISOETES ECHINOSPORA, *Dur.*—Loch a little south of Tarbert, W. S. Duncan, *sp.*; Scarp, 1897, Duncan, *sp.*; in West Ross (Ewing, *sp.*) and West Sutherland (C. S. Marshall, *sp.*).

[*I. lacustris*, L., occurs in Shetland (Beeby), but is not on record for Orkney.]

NITELLA CONFERVACEA, *A. Braun* (N. GRACILIS, var. CONFERVACEA, *Breb.*)—To this the Messrs. Groves[1] now refer the *N. Nordstedtiana*, H. and G. Groves, = *N. batrachosperma*, A. Br. (name only). They also give it for the Lakes in Ireland. It is a very rare species, and one of the smallest and most delicate of the order.

The following species are remarkable as absentees from the Outer Hebrides, the numbers placed after the

[1] In Babington's "Man. Br. Bot." 9th ed. p. 539, 1904.

names are the census of counties in which they are on record.

Arabis Thaliana, *L.*—103.
Stellaria Holostea, *L.*—111.
„ graminea, *L.*—111.
Fragaria vesca, *L.*—111.
Geum rivale, *L.*—100.
Conopodium denudatum, *Roch.*—111.
Asperula odorata, *L.*—110.
Veronica hederæfolia, *L.*—101.
„ Chamædrys, *L.*—111.
Mentha arvensis, *L.*—111.
Mercurialis perennis, *L.*—109.
Betula alba, *L.*—110.
Festuca pratensis, *L.*—97.
Lycopodium clavatum, *L.*—99.

CROYDON, DECEMBER 1904.

ADDITIONS AND CORRECTIONS TO THE TOPOGRAPHICAL BOTANY OF SCOTLAND.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S.

IN this journal, during the years 1898, 1899, and 1900, I endeavoured to give in the briefest possible form an abstract of the distribution, so far as then known, of all plants growing in Scotland not evidently in cultivation. Their distribution was indicated by the methods used by Mr. H. C. Watson in his "Topographical Botany of British Plants," the counties, or parts of counties ("vice-counties"), being numbered from 72 to 112 inclusive. These divisions, though not natural, are so familiar otherwise, and have been so generally made use of in past records, that they offered considerable advantages in the attempt to sum up what was known. I also sought to ascertain as far as I could, and to indicate, the claims of the several plants to be regarded as "native" or existing in Scotland apart from human agency. *Rubus* and *Hieracium* formed the subjects of separate papers in this journal, and *Salix* was unfortunately omitted by mischance.

In dealing with so great a multitude of figures it was inevitable that errors should occur, both of omission and of commission; and in estimating the claims of doubtful species to be accepted as "native" one is naturally impressed by the conditions familiar to oneself, and may misjudge the evidence

for or against afforded by other localities. Of the existence of such errors, of commission as well as of omission, careful revision has made me only too fully aware, and I very much regret their occurrence, and have felt that they ought to be pointed out and corrected. But since 1900 much fresh information has been gained and made known regarding the distribution of the flora of Scotland in this journal, in the "Journal of Botany," and in the publications of various Societies. I have also to thank several friends for letters containing valuable notes, and personal observations have added considerably to my knowledge of the plants of north-eastern Scotland.

As the following pages will show, these additions and corrections affect by far the greater number of the species already mentioned, and they will also include mention of a large number of additional species detected in Scotland within recent years, even though all but a few of these additions must be regarded as mere "casuals," unable to retain their place for more than a brief time. So long as they are clearly recognised and indicated as casuals, it is well to note their presence, even if but to note the fact that they have failed to acquire a footing when brought into the country in some way. Many species now well established in Scotland (e.g. *Mimulus Langsdorffii*, now so abundant in ditches and by streams) must have passed through the "casual" stage in, perhaps, a not very remote past; and it is desirable to record when they were first observed, and how they gained their place against adverse conditions.

For convenience of reference the names have been retained as given in the former paper, except where evidently erroneous determinations.

The term *alien* is used to denote a plant that owes its presence in Scotland to human agency, whether intentionally introduced for use or ornament, or unintentionally, as weeds mixed with cultivated plants, or by the operations of industry or commerce. *Aliens* include (1) plants of cultivation, most of which die out soon, unless intentionally protected and favoured by man; (2) *colonists*, or weeds of ground under regular cultivation, which die out when such cultivation ceases, though difficult to extirpate while it is continued;

(3) *denizens*, or plants capable of surviving and of forming a permanent part of the flora beyond the limits of cultivation, and after it has ceased; (4) *casuals*, or plants unable to propagate themselves or to retain their place for more than a brief period.

These four conditions of permanence are not easily separable, a species frequently belonging to different grades in different districts, or being *native* in certain districts and clearly an *alien* in others. It is often almost impossible to determine with certainty whether a species is *native* or merely a *denizen*. Where there is a reasonable certainty that the species is *alien* in Scotland its name is printed in italics; but where there is room for doubt the name is printed in ordinary type, and the mark †, or *cas.*, follows each vice-county in which it appears to be alien.

The presence and distribution of the aliens, and the sources from which they have been brought, throw curious lights on the commerce and social conditions of Scotland in the past and present.

It seems desirable to repeat here the equivalence of numbers and areas used in the former articles, accepting H. C. Watson's areas:—

West Lowlands.—72, Dumfries; 73, Kirkcudbright; 74, Wigtown; 75, Ayr; 76, Renfrew; 77, Lanark.

East Lowlands.—78, Peebles; 79, Selkirk; 80, Roxburgh; 81, Berwick; 82, Haddington; 83, Midlothian or Edinburgh; 84, Linlithgow.

East Highlands.—85, Fife and Kinross; 86, Stirling; 87, West Perth and Clackmannan (as far as in Forth basin); 88, Mid Perth (from West Perth to rivers Tay and Garry); 89, East Perth (east of rivers Tay and Garry); 90, Forfar; 91, Kincardine; 92, South Aberdeen; and 93, North Aberdeen, separated by watershed passing east and west through Inverurie; 94, Banffshire; 95, Elgin; 96, East Ness (including Nairn and Inverness-shire, draining to North Sea).

West Highlands.—97, West Ness (including Inverness-shire draining to Atlantic, and Argyll north of Linnhe); 98, Argyll (between Loch Linnhe and Crinan Canal); 99, Dumbarton; 100, Clyde Isles (in Firth of Clyde); 101, Cantire; 102, South Ebudes (Isla, Jura, and adjacent islands); 103, Mid Ebudes (Mull, Coll, and adjacent islands); 104, North Ebudes (Skye, Rum, and adjacent islands).

North Highlands.—105, West Ross (Ross and Cromarty draining to Atlantic); 106, East Ross (Ross and Cromarty draining to North Sea); 107, East Sutherland (draining to east); 108, West Sutherland (rest of county, draining to north and west); 109, Caithness.

North Isles.—110, Hebrides (west of the Minch) and St. Kilda; 111, Orkneys; 112, Shetland.

(*To be continued.*)

FUNGI GATHERED IN THE PARISH OF FORDOUN, KINCARDINESHIRE.

By John Mason.

Some of the leathery or corky species of fungi that grow on dead wood are perennial; but all those stalked forms which we call mushrooms and toadstools are annuals. They are propagated by minute seeds termed spores, and begin to appear in August or, in favourable seasons, earlier; their number greatly increases in September and October; they are much less numerous in November, and by the end of that month most of them are usually killed off by frost. Fungi grow in a great variety of situations: some species are to be looked for in old pastures, others on animal excrements, but it is in woods that they most abound. The species included in the following list all belong to the Basidiomycetes, except the last five, which are Ascomycetes. The total number of British species belonging to these two great orders is said to be upwards of three thousand two hundred and fifty.

BASIDIOMYCETES.

AGARICINEÆ.

Amanita aspersa, Fr.—Occasionally seen. Cap warty.
A. muscaria, Fr.—This tall, handsome fungus, the "splendid chief of the agaricoid tribe," is very poisonous.
A. rubescens, Fr.—Among grass. Turns red when bruised.
A. strobiliformis, Vitt.—Under trees. Cap very warty.
Amanitopsis vaginata, Roze.—A tall and elegant toadstool.

Armillaria mellea, Vahl.—On decaying wood. Gregarious.
A. constricta, Fr.—On the ground. Smells of new meal.
Tricholoma personatum, Fr.—Among fallen leaves.
T. virgatum, Fr.—Among short grass under trees.
Collybia confluens, Pers.—In woods. Several in a tuft.
C. radicata, Relhan.—On the ground in woods.
C. velutipes, Fr.—On dead trees and roots. Tufted.
Laccaria laccata, Scop.—Gills pink, purple, or violet.
Clitocybe candicans, Pers.—Among decaying leaves.
C. maxima, Gärtn. and Mey.—Large species; cap eight inches broad. I have seen specimens with radially split caps, and slightly decurrent gills which would indicate *C. gigantea*, Sow., rather than *C. maxima*.
C. nebularis, Batsch.—Among grass under spruce trees.
C. pithyophila, Fr.—In woods among fallen leaves.
Mycena corticola, Fr.—A parasite on living trees.
M. filopes, Bull.—Among dead leaves. Cap bell-shaped.
M. vitilis, Fr.—Among grass. Cap bell-shaped.
M. pelliculosa, Fr.—Among grass. Cap and stem viscous.
M. leucogala, Cooke.—Stem filled with milky juice.
Pleurotus petaloides, Bull.—On decaying wood.
P. porrigens, Pers.—On dead trees. Gregarious.
P. serotinus, Schr.—On dead wood. Gregarious.
Hygrophorus psittacinus, Schaef.—In pastures. Greenish.
H. virgineus, Wulf.—In pastures. Wholly white.
Cantharellus aurantiacus, Fr.—Among grass in woods.
C. cibarius, Fr.—In grassy places. Abundant.
C. cinereus, Fr.—In a wood.
C. Houghtoni, Phil.—In a wood. Not common.
C. infundibuliformis, Fr.—On the ground in a wood.
Lactarius blennius, Fr.—Among grass in woods.
L. piperatus, Fr.—Borders of woods. Taste very peppery.
L. plumbeus, Bull.—Among grass in a pine wood.
L. torminosus, Schaef. In a pine wood.
L. zonarius, Fr.—In open spaces in woods.
Russula citrina, Gillet.—Very common in the woods.
R. emetica, Fr.—On the ground. Common in the woods.
R. nigricans, Fr.—In the woods. Turns black when old.
R. rubra, Fr.—In a fir wood. Local.
Marasmius oreades, Fr.—In grass. The Fairy Ring fungus.
Panus stypticus, Fr.—On rotting trunks of trees.
Pluteus cervinus, Schaef.—Probably var. *eximius*, the gills being half an inch wide, and the stem seven inches high.
Pholiota aurivella, Bat.—On a heap of sawdust. Tufted.
P. marginata, Batsch.—On the bark of dead trees.
P. squarrosa, Müll.—Near decaying wood. Cap scaly.

Gomphidius glutinosus, Schaef.—Under fir trees.
Hebeloma longicaudum, Pers.—In a fir wood.
Flammula flavida, Schaef.—On a heap of old sawdust.
F. hybrida, Fr.—On fir sawdust and dead roots.
F. ochrochlora, Fr.—On sawdust. Densely tufted.
F. spumosa, Fr.—On or near dead roots. Very viscous.
Paxillus involutus, Fr.—Margin of cap always incurved.
Agaricus (*Psalliota*) *campestris*, L.—In old pastures only. I once met with a form which had all the characters of *A. campestris* except that it was growing in a wood, and that its tapering stem, slightly enlarged at top and bottom, was seven inches high. It seemed to be var. *silvicola*, Vitt.
A. arvensis, Schaef.—In a grass field. I have seen fifty of these large mushrooms growing together in a half-circle.
Stropharia æruginosa, Curt.—In woods. Green, glutinous.
S. semiglobata, Bat.—On dung in pastures. Hemispherical.
S. stercoraria, Fr.—On dry dung in pastures.
Hypholoma fasciculare, Huds.—On fir-stumps and sawdust.
Panæolus campanulatus, L.—Near a manure heap.
P. sub-balteatus, Berk. and Br.—On a manure heap.
Psathyrella atomata, Fr.—On the ground among grass.
Coprinus comatus, Fr.—Attains a height of one foot.
C. micaceus, Fr.—On decaying tree-roots. Tufted.
C. niveus, Pers.—On horse-dung in pastures.
C. stercorarius, Fr.—On a manure heap.

Polyporeæ.

Polystictus versicolor, Fr.—On dead wood; fan-shaped, velvety, with concentric zones of various colours; sometimes several plants combine to form a beautiful rosette three or four inches broad.
Fomes igniarius, Fr.—On dead roots. Perennial.
F. annosus, Fr.—On dead roots. Perennial.
Polyporus acanthoides, Fr.—On rotten trunks and roots.
P. betulinus, Fr.—On fallen birch-trees only.
P. chioneus, Fr.—On decaying stumps. Pure white.
P. brumalis, Fr.—On dead branches in winter.
P. fragilis, Fr.—Turns brown where touched with the finger.
P. squamosus, Fr.—On beech roots; a large, scaly species.
Boletus æstivalis, Fr.—In a wood. Only one plant found.
B. chrysenteron, Fr.—In woods, and pastures near woods.
B. edulis, Bull.—Borders of woods. Edible.
B. elegans, Schum.—Sometimes seen—scarce.
B. flavus, With.—Under trees; a pretty yellow species.
B. luridus, Schaef.—Turns blue when cut or bruised.
B. piperatus, Bull.—Borders of woods. Taste peppery.
B. pachypus Fr.—Turns blue when cut or bruised.

B. subtomentosus, L.—At the edge of a pine wood.
Merulius lacrymans, Fr.—On dead trees, also on timber.

Hydneæ.

Hydnum repandum, L.—Plentiful in several woods.
H. bicolor, Alb. and Schw.—On dead bark. Very thin.

Clavarieæ.

Sparassis crispa, Fr.—Under pines in a wood. Rare.
Clavaria coralloides, L.—White, prettily branched.
C. cristata, Holm.—Shaped like a miniature stag's horn.
C. fragilis, Holm.—Among grass. White, brittle, tufted.
C. vermicularis, Scop.—Among grass in white tufts.

Phalloideæ.

Phallus impudicus, L.—On the ground. Common.

Nidularieæ.

Cyathus vernicosus, DC.—On the ground in a garden.
Nidularia pisiformis, Tul.—On a dead fir-branch.

Lycoperdeæ.

Lycoperdon echinatum, Pers.—On the ground in a wood.
L. perlatum, Pers.—Common in thickets of fir-trees.
L. bovista, L. (*Bovista gigantea*, Batsch.).—Among grass. I have seen five or six of these huge puff-balls in a group, the largest of which had a girth of thirty-three inches. Rare.

Sclerodermeæ.

Scleroderma vulgare, Fr. Local. Not seen every season.
S. bovista, Fr.—Among grass, but not common.

ASCOMYCETES.

Pezizeæ.

Peziza aurantia, Fr.—On the ground among trees.
P. vesiculosa, Bull.—On manure heaps.
P. repanda, Wahl.—On an old cinder heap.

Helvelleæ.

Leotia lubrica, Pers.—Among grass near beeches.

Xylarieæ.

Xylaria hypoxylon, L.—Common on decaying roots.

ZOOLOGICAL NOTES.

Greenland Seal taken in Sutherlandshire.—Some time back I received a sealskin from a Sutherlandshire crofter, who had been out with me as ghillie in years gone by. It turned out to be the skin of a Harp Seal or Greenland Seal (*Phoca grœnlandica*). On learning recently of the rarity of its occurrence on British coasts, I have made inquiry as to the circumstances attending its capture. On the last day of December 1903, three lobster fishermen belonging to Loch Nedd in Assynt, when returning from their fishing, saw a large seal floating on the water, asleep, in the narrows in the inner part of the loch. They approached very cautiously, and were able to get near enough to stun it by a blow on the head with a "foot-spar" (? boat-stretcher). Though the seal struggled for some time, they managed to secure it. They say they obtained 40 bottles of oil from the blubber. The skin measures from the nose to the beginning of the hind flippers a little over six feet in length. It is just under five feet in width.—John P. Way, Rossall, Fleetwood.

[This rare visitor to the British coasts was somewhat abundant on the east coast of Scotland in the spring of 1904. See "Annals," 1904, p. 184.—Eds.]

Remarkable Visitation of Migratory Birds to Shetland.—We have had a great rush of migratory birds, equal in numbers to that of the 15th of April 1898, but scarcely in variety. On the evening of the 12th of April, the wind shifted round from the N. to S.E., and by morning was blowing a strong gale, which lasted until the 17th. I did not observe any strangers the first day, but after that they came in great numbers. I have had many birds described to me by other people, which I believe to be rare, but I refrain from naming them. The most interesting occurrence was that of a Hoopoe (*Upupa epops*), an adult male, found dead. The following is a list of the other species which as immigrants and birds of passage also came under my notice:—Ring Doves (*Columba palumbus*), two; Rooks (*Corvus frugilegus*), large flocks; Jackdaw (*C. monedula*), one; Redwings (*Turdus iliacus*), many; Fieldfares (*T. pilaris*), many; Blackbirds (*T. merula*), a few; Chaffinches (*Fringilla cælebs*), a few; Redbreasts (*Erithacus rubecula*), immense numbers; Hedge Accentors (*Accentor modularis*), immense numbers; Pied Flycatchers (*Muscicapa atricapilla*), a few; Pied Wagtail (*Motacilla lugubris*), one; White Wagtails (*M. alba*), numerous; Siskins (*Chrysomitris spinus*), a few; Goldcrests (*Regulus cristatus*), many, several found dead; Meadow Pipits (*Anthus pratensis*), great numbers; Wheatears (*Saxicola œnanthe*), a great many.—Thomas Henderson, Jun., Dunrossness, Shetland.

[This great movement also came under the notice of Mr. John

G. Tullock of Lerwick, who reports Redbreasts, Chaffinches, Greenfinches (*Ligurinus chloris*), Willow Warblers (*Phylloscopus trochilus*), and Rooks as being numerous, some of them especially so during the period named.—Eds.]

Bird-Notes from Shetland.—During the five months January to May inclusive, the weather has on the whole been unsettled, wet, and stormy. During January the prevailing wind was S.W., February W., March S.E. to S.W. (about equal), April N.E., May W.-S.W. Mean barometric pressure = 29·775 inches at sea-level. Rain has fallen on 134 days, the total amount of rainfall being 17·68 inches, as compared with 22·19 inches during the same period last year.

The following is a list of the rarer migratory birds which have visited us up to date :—

Carrion Crow (*Corvus corone*).—Five seen along with two Hooded Crows at Haroldswick at 2 P.M. on 25th February. These are the first I have seen in Shetland.

Rook (*C. frugilegus*).—Arrived on 4th March, last seen on 19th April.

Jackdaw (*C. monedula*).—One seen at 11 A.M. on 3rd February, another (or perhaps the same one) at the same place on 1st April.

Blackbird (*Turdus merula*).—Commenced building on 16th April. Four nests with eggs up to date. Young first hatched on 22nd May.

Moorhen (*Gallinula chloropus*).—One on 28th April.

Snowy Owl (*Nyctea scandiaca*).—One in grey plumage at Baltasound on 4th April.

Bullfinch (*Pyrrhula europæa*).—First seen on 19th March at 2.10 P.M. Others in my garden from 16th April to 26th; they seemed somewhat larger and duller coloured than our usual English Bullfinch.

Landrail (*Crex pratensis*).—First heard on 16th May, seen, "flushed" by my dog, on 17th May.

Great Skua (*Stercorarius catarrhactes*).—Arrived on 11th April, first eggs seen on 24th May, at least thirty-four nests with eggs on 1st June. One new colony started.

White-tailed Eagle (*Haliactus albicilla*).—One seen at Baltasound at 6 P.M. on 1st June.

Between the 16th and 18th of April, there was a fair rush of the following migrants, viz. :—Chaffinches, great numbers; Bullfinches, a few; Goldcrests, a few; Pied Flycatchers, a few; Redbreasts, fair number; Willow Wrens, a few; Redwings, good-sized flocks (numbers increased on 25th April).

A few Bramblings and large numbers of Fieldfares arrived on 25th April. I have seen no Redstarts this year.—T. Edmondston Saxby, Baltasound, Shetland.

Pied Flycatcher nesting in Midlothian.—A welcome addition to the instances of a rare species nesting in Midlothian is recorded this month from a locality near Edinburgh, known to the Editor, but which need not be here specified. A Pied Flycatcher (*Muscicapa atricapilla*) was first noticed on the 1st May, and a few days later was seen carrying material for nesting. The nest was found to be in an oak tree about 12 feet from the ground. As there is every chance of the brood being reared safely, there is reason to hope that this nest may be the forerunner of a colony of these interesting and beautiful birds in the district.—Chas. Campbell, Cramond Bridge.

[Mr Wm. Evans informs us that on the 7th June 1885 he found a pair of Pied Flycatchers building in a hole in an old ash at Arniston, Midlothian; and that in 1890, a ♂, which he saw in the bird-stuffer's hands, was shot on the 13th June at Dalhousie Castle, a few miles farther down the Esk towards Dalkeith.—Eds.]

Greenland Falcon in Inverness-shire.—An immature male Greenland Falcon (*Falco candicans*) was shot on a farm near Spean Bridge in March last. It was killed while in the act of attacking some domestic fowls.—Cecil H. Bisshopp, Oban.

Former abundance of Eagles in Shetland.—The annexed copy of a certificate is interesting, since it affords evidence that in the first half of the nineteenth century there must have been quite a number of Eagles in the Islands. Doubtless the "head money" was the cause of their decrease and practical extinction.

Copy Certificate

Lerwick, 24*th April* 1835.

These certify that the bearer, William Bain, has produced 7 eagles' heads to me, and is entitled to the premium for destroying same, which the collector of cess is hereby authorised to pay.

(Signed) Will. Mouat,
Commr. Supply.

—John S. Tulloch, Lerwick.

Occurrence of the Pacific Eider Duck in Orkney.—An adult drake Eider, of the species or race found in North-western America and North-eastern Asia, was shot out of a flock (presumably consisting of common Eiders) at Graemsay, Orkney, about the middle of December last, by a wild-fowler named George Sutherland. It was seen in the flesh by Mr. Charles Oldham, and after being mounted was exhibited at the January meeting of the British Ornithologists'

Club. This species is not only an addition to the British avifauna, but has not previously been detected in European waters. The male of the Pacific Eider (*Somateria v-nigrum*) differs from that of the Common species (*S. mollissima*) in possessing in its adult stage a large V-shaped mark on the throat, but the females are very similar in plumage. This specimen was first recorded ("Nature," vol. 71, p. 201) as having been obtained at Scarborough in Yorkshire, the town to which it was consigned from Orkney. It was finally sent to Oldham, in Lancashire, and has been presented to the Public Museum there.

Deal-fish or Vaagmaer on the Banff Coast.—There was landed at Whitehills, Banff, a specimen of the Deal-fish or Vaagmaer (*Trachypterus arcticus*), a fish not often met with in these waters. It was found by Mr. Watson, foreman of the salmon-fishing station, entangled in a net, on the 23rd of March. This specimen measured 3 feet 6 inches long, which is about the usual length, though occasionally it grows much longer. It was of a bright silvery colour, and the slimy pigment with which the fish is covered came off when it was handled. The dorsal region was provided with an almost continuous delicate fin. A very distinct median lateral line was furnished with sharp spines projecting forward. A similar fish was washed ashore to the west of Whitehills just over a year ago, but owing to having lain on the beach for some time it was in a too decayed state for preservation. There is an Irish record of a fish of this kind measuring nearly 8 feet long, and one was got at Montrose in 1872, which was 6 feet in length. I am preserving the specimen, and am in communication with Professor D'Arcy W. Thompson regarding the acquisition of the specimen for the University College Museum, Dundee.—John Lemmon, Banff.

Sturgeon in the Shetland Seas.—I note that Mr. John S. Tulloch, of Lerwick, publishes ("Annals," 1905, p. 120) the first authentic record of this fish, for the Shetland Seas. I remember in 1884 (July or August) a Sturgeon being brought ashore at Baltasound; it was identified by a Captain Burns, who was here at the time superintending some diving operations in connection with the repairing of a steamer which had struck on some rocks. I was only a boy at the time and thought little of the matter.—T. Edmondston Saxby, Baltasound, Shetland.

Rare Scottish Beetles.—I am indebted to Mr. P. H. Grimshaw, of the Royal Scottish Museum, for the identification of the following rare beetles taken by me:—(1) *Hallomenus humeralis*, Panz—several specimens in fungus (*Clavaria*) at Balmacaan, Drumnadrochit, Inverness-shire, 14th August 1904; (2) *Exomias araneiformis*, Schr.—two specimens, under stone, Dumcarrow Craig, Fifeshire, 11th April 1901; and (3) *Epuræa deleta*, Er.—an abnormal

specimen found in fungus in Bonnytoun Den, Fifeshire, 9th July 1902.—James Haig Johnston, Edinburgh.

[Fowler, in his "Coleoptera of the British Islands," says of the first-named species: "Scotland, rare, in *Trametes pini*, etc., Tay and Dee districts;" and of *Exomias araneiformis*: "ceases entirely in the north, and is not recorded from the Northumberland and Durham district, nor has Dr. Sharp ever come across a Scotch example, although it must be admitted that Murray records it as 'occasional in Scotland.' In the Lennon collection in the Royal Scottish Museum there are 19 examples, all from Mid-Solway," and it has been recorded from "Clyde" and "Forth" by Messrs. Fergusson and Evans (see "Annals," 1900, p. 100). The *Epuræa* was a very interesting example, which completely puzzled me. I sent it to Dr. Sharp, who kindly identified it for us. Instead of the usual yellow spots on the elytra there are two conspicuous yellowish raised "bosses" which give the beetle a very remarkable appearance. Mr. Johnston has presented the specimen to the Museum.—P. H. G.]

Grammoptera ruficornis, *F.*, in the Forth District.—In June of the present year I was fortunate enough to capture a specimen of this Longicorn Beetle on hawthorn blossom in Colinton Dell. On referring to Fowler's work on the "Coleoptera of the British Islands," vol. iv. p. 243, I found, curiously enough, the following statement:—"recorded by Dr. Sharp as very rare in Scotland in the Tweed and Forth districts, 'Colinton near Edinburgh and Peasedean,' Murray's 'Cat.'" I also saw the original reference, which is given in Murray's "Catalogue of Scottish Coleoptera," p. 85 (1853). It is perhaps worth while to record the fact that the beetle is still to be found in the locality whence it was recorded over fifty years ago. Mr. P. H. Grimshaw, of the Royal Scottish Museum, has seen the specimen and confirmed my identification.—Andrew Paterson, Edinburgh.

[Has also been taken at Polton by Mr. W. Evans—"Annals," 1903, p. 96.—Eds.]

Microdon latifrons, *Lw.*, and other Diptera at Nethy Bridge.—It may interest the few to know that a specimen of *Microdon latifrons*, Lw., was taken here on the 16th June. This appears to be the fourth specimen which has occurred within the British Isles; and as the specimen taken at Nethy Bridge in 1900 was wrongly identified by me as *M. devius*, and placed by Verrall under that species, it appears advisable to draw attention to the fact. Among other noteworthy captures made here the following may be recorded:—*Hypoderma diana*, Brauer (an extension of its beat into the Abernethy Forest), *Cynorrhina fallax*, L. (in numbers), *Rhaphium longicorne*, Fln., *Antichæta analis*, Mg. (*Sciomyza vittata* of Verrall's List), etc. At Nairn, during the early part of this month, the number of

the genus *Porphyrops* occurring in the bed of the river Nairn was remarkable—this was true both in individuals and species—*P. rivalis*, Lw. (only recorded from a single ♂ taken at Aviemore last year), *P. patula*, Radd., *P. riparia*, Mg., *P. crassipes*, Mg., and another species—possibly *P. gravipes*, Walk.—occurring in great numbers.

Tabanus luridus, Fln., appears to be the common Horsefly of the spring and early summer, and was met with on the sand-hills near Nairn in great numbers; by good luck 4 ♂'s were obtained sitting on a sandy road.—J. W. Yerbury, London.

BOTANICAL NOTES AND NEWS.

Trees of Scotland.—I shall be glad of observations and measurements of trees in Scotland, also of notes on the highest latitude and altitude on mountains reached by them, and their habit (trees or shrubs) at these limits, more especially as regards the following:—

Pyrus Aucuparia, Rowan or Mountain Ash.

Alnus glutinosa, Alder.

Fraxinus excelsior, Common Ash.

Ulmus montana, Scotch or Wych Elm.

Betula pubescens, Common Birch } Do these occur, in the wild
B. verrucosa, White Birch } state, over separate areas or mixed? Do they show any separation of different habits (pendulous and upright)? and are the habits constant for the two species?

Quercus sessiliflora, Sessile-fruited Oak } Have these distinct
Q. pedunculata, Common Oak } areas of distribution? Oak is found in Orkney in peat-mosses. How far north does it now occur in the wild state?

Salix alba, White Willow.

S. fragilis, Crack Willow.

Populus alba, White Poplar.

P. tremula, Aspen. Does this ever occur as a large tree, *i.e.* exceeding 60 ft. high by 4 ft. in girth?

Pinus sylvestris.

—Augustine Henry, 13 Westpark Gardens, Kew.

Pyrus Aria in Scotland.—I gather from Prof. Trail's note in the current number of the "Annals" (page 123) that he would not

admit the White Beams found in Braemar to be indigenous. They are few in number there and inconsiderable in size, but they occur from the neighbourhood of the village upwards to the Linn of Dee.

How came they there?—HUGH BOYD WATT.

The Plants of the Flannan Islands.—Mr. W. Eagle Clarke very kindly sent me the plants collected by him during his visit to the Flannan Islands in 1904. They may be taken as representing almost the entire number of flowering plants on the main island, as he observed in addition only two inconspicuous grasses, not in characteristic condition. The isolated situation is no doubt the cause of the flora being so very limited in the number of species. Some are represented in the collection by a single specimen, while of others there are several. Almost all are luxuriant in their growth, and some are remarkably large and fleshy, indicating a richly manured and saline soil. There are no otherwise peculiar varieties. The entire list of species brought by Mr. Clarke is as follows:—

Ranunculus acris, L., apparently *rectus*, Bor., but the specimen, preserved in formalin, does not allow of certainty.

Cochlearia officinalis, L., two examples, the leaves large and fleshy.

Silene maritima, With., leaves exceptionally broad and fleshy.

Stellaria media, L. } luxuriant plants, with large leaves
Cerastium triviale, Link. } and few flowers.

Sagina procumbens, L., rather fleshy. On the stems were a few clusters of *Puccinia Arenariæ*, Schum.

Matricaria inodora, L., one flowering branch of *Matricaria*, despite its fleshy growth, appeared to belong to *M. inodora* rather than to *M. maritima*.

Glaux maritima, L.

Armeria maritima, L., small and narrow-leaved.

Plantago maritima, L., one plant with broad, fleshy leaves, almost glabrous.

P. Coronopus, L., one plant, with hairy, large, bipinnately-cut, three-nerved leaves, the ultimate lobes being broad and acute or acuminate.

Atriplex Babingtonii, Woods.

Holcus lanatus, L., like the other species rather thicker and more fleshy than usual.—JAMES W. H. TRAIL.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1905.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Wild Cats in Argyllshire. "A. H." *The Field*, 20th May, 1905, p. 854.—Refers to a female caught in a trap in the vicinity of Laga, Ardnamurchan. The lair was afterwards discovered and four kittens captured.

Gulls on the Bass Rock. *The Field*, 6th May 1905, p. 762.—A summary of a paper by Mr. W. Evans, in the *Proc. Royal Phys. Soc. Edin.*, vol. xvi. part 2.

Pacific Eider (Somateria v-nigrum) in Orkney. Fred Stubbs. *Zoologist*, April 1905, p. 142.—Further notes on the bird recorded in the *Zoologist*, 1905, p. 74.

Pacific Eider in Orkney.—H. W. Robinson. *Zoologist*, April 1905, p. 143.—Details of the capture of the specimen above alluded to, and notes on other specimens seen.

Gyrophæna pulchella, Heer, in Scotland. Arthur J. Chitty. *Ent. Mo. Mag.*, April 1905, p. 92.—Reported as abundant at Kincorth.

List of British Dolichopodidæ, with Tables and Notes (*continued*). G. H. Verrall, F.G.S. *Ent. Mo. Mag.*, April 1905, pp. 81-83, and May 1905, pp. 108-112.—Numerous Scottish localities are mentioned in this useful paper.

Limax tenellus (Müll.) in "Forth" Area. W. Evans. *Proc. Roy. Phys. Soc. Edin.*, vol. xvi. No. 1, p. 22.

Further Additions to the List of Spiders from the Edinburgh District (Third Supplement). Prof. G. H. Carpenter and W. Evans. *Proc. Roy. Phys. Soc. Edin.*, vol. xvi. No. 2, p. 27.

The Blackbacks of the Bass. W. Evans. *Proc. Roy. Phys. Soc. Edin.*, xvi. No. 2, p. 42.

BOTANY.

Supplement to "Topographical Botany," ed. 2. By Arthur Bennett, F.L.S.—Issued as a separately paged supplement to *J. Bot.*

from March 1905 onwards, 16 pages each month. Under each species it enumerates the additions to vice-county records since 1883, and will of course be indispensable to all students of British plant-distribution.

Silene dubia, Herbich, in Britain. By C. E. Salmon, F.L.S. (*J. Bot.*, 1905, pp. 127-128).—Calls attention to this as the true name of a form included in British floras under *S. nutans*.

German Side-lights on some British Rubi. By Rev. E. S. Marshall, M.A., F.L.S. (*J. Bot.*, 1905, pp. 73-78).—A review of Dr. W. O. Focke's monograph of Rubi in Ascherson and Graebner's *Synopsis der mittel-europaeischen Flora*, with special reference to British forms.

List of "Introduced" or "Alien" Plants gathered by Members of the Society in the Neighbourhood of Edinburgh during 1903 and 1904. By James Fraser and James M'Andrew (*Tr. Ed. F. N. and M. Soc.*, 1904).

Some Forfarshire Plants. By Rev. E. S. Marshall, M.A., F.L.S., and W. A. Shoolbred, F.L.S. (*J. Bot.*, 1905, pp. 114-116).—Contains a few new county records of obscure forms and hybrids.

The Flora of Buchan—its Distribution, Origin, and Relations to Man. By James W. H. Trail, A.M., M.D., F.R.S. (*Tr. Buchan Field Club*, 1904-5, pp. 2-56).—Analyses the flora, and gives additions to previous lists.

Legendary Plant-Lore. By A. M'D. Reid, M.A. (*Tr. Buchan Field Club*, 1904-5, pp. 106-128).—Does not contain any local matter.

Notes on the Rarer Woodland Plants of Scotland. By D. S. Fish (*Tr. Ed. F. N. and M. Soc.*, 1904).

Notes on Mosses from West Kilbride, Ayrshire. By D. A. Boyd (*Tr. Ed. F. N. and M. Soc.*, 1904, pp. 94-97).—*Tortula ruraliformis* and *Brachythecium albicans* are noticed.

New and Rare British Hepaticæ. By Symers M. Macvicar (*J. Bot.*, 1905, pp. 117-120).—Enumerates, with critical notes and localities, nine species or varieties, all of which have recently been detected in Scotland.

Hepatics of Caithness. By Rev. D. Lillie, B.D. (*J. Bot.*, 1905, pp. 124-127).—A list, with localities, of all species collected in the county by the author.

Life-History of Glæocapsa crepidinum. By G. T. West (*Tr. Ed. F. N. and M. Soc.*, 1904, pp. 130-133).

BOOK NOTICES.

THE GEESE OF EUROPE AND ASIA: BEING THE DESCRIPTION OF MOST OF THESE INHABITING THE OLD WORLD. By Sergius Alphéraky. With 24 coloured plates by F. W. Frohawk, and a frontispiece by Dr. P. P. Sushkin. (London: Rowland Ward, Ltd., 1905.)

There are few groups of old-world birds about whose habits and stages of plumage so little is known as the Geese. That this should be so is in a great measure, perhaps entirely, due to the fact that they are by nature wary beyond all others, and seek resorts far removed from the haunts of man. On these accounts they are not only extremely difficult to observe, but satisfactory material for the study of their plumages accompanied by reliable data as to the age of the specimens is well-nigh impossible to procure. It is this question of age, and the peculiarities of dress associated therewith, that has hitherto rendered our knowledge of particular phases in the plumage of the Geese more or less imperfect.

The book under notice does not pretend to entirely supply these *desiderata*; for its author, with admirable candour, tells us that he cannot consider his work otherwise than as preparatory to further investigation. It must be regarded, however, as an important and welcome contribution to ornithological literature: one that considerably advances our knowledge through the investigations of its author, and forms a most excellent basis for future research. It affords much information not to be found elsewhere on the various phases of plumage of the species treated, from the chick to the adult, on their habits, nesting, migrations, and geographical distribution. Practically all the literature relating to the subject has been laid under contribution, and much has been culled from Russian sources which are tapped for the first time so far as the British reader is concerned.

The British aspect of the subject has received much attention; and it is interesting to know that the great majority of the Bean Geese visiting our Islands belong to the Yellow-billed species—the *Anser arvensis* of Brehm—and thus a new species is added to the British avifauna, though the author suggests that it may be the bird to which Strickland gave the name of *Anser paludosus*. The remarks, however, on all the British species, and especially those on the Grey Geese, are well worthy of attention.

In all, 21 species and subspecies are treated of in the most thorough manner in this handsome volume; and of these no less than twelve have a place in the British fauna. All are figured in a series of twenty-four excellent coloured plates, of which three are most usefully devoted to life-sized figures of the bills of each

species or subspecies. Throughout the text, too, figures are freely given of the bills of the allied forms in order to show their peculiarities, and as an aid to their identity.

The work contains two Supplements: one on the Eggs of Geese by G. F. Göbel, and another giving an account of S. A. Buturlin's ornithological experiences in Kolguev.

Enough has been said to indicate that the book is replete with varied and valuable information relating to a singularly attractive group of birds. It contributes much to our previous knowledge regarding their histories from all standpoints; and is indispensable to all who are interested in the subject.

Wild Birds at Home. Sixty photographs from life by Charles Kirk, of British Birds and their Nests. Glasgow: Gowans and Co., Ltd.; London: Brimley, Johnson and Ince, Ltd.

This is a neat little book containing sixty pictures, all of which are of great excellence and interest and beautifully reproduced; indeed, we have seen few, if any, better in either respect. The price is 6d., or in cloth 1s., and we are not surprised to learn that it has had a phenomenal sale, several editions having been exhausted during the few weeks it has been before the public.

We hope that this well-merited success will induce Mr. Kirk and the publishers to give us a further series of these delightful peeps into the life of Wild Birds at Home. A number of the scenes in the present series are laid at Ailsa Craig.

The Life and Work of George Don. By G. Claridge Druce, M.A., F.L.S.

In this Memoir of 238 pages, recently issued as No. xii. of "Notes from the Royal Botanic Garden of Edinburgh," Mr. Druce has conferred a benefit on lovers of the flora of Scotland, and has brought within easy compass the material from which to gain a truer appreciation of the great additions made by G. Don to what was previously known of that flora, and at how great personal labour and sacrifices he carried on his investigations. The subject is one that has been investigated by Mr. Druce for a number of years, and he has previously criticised the attitude to Don's discoveries taken up by Prof. Walker-Arnott, and has also given a short account of Don in his Presidential Address in 1902 to the Pharmaceutical Conference in Dundee, on the progress of botanical investigation in Scotland. In this new work we have a *Memoir* of his life and surroundings as far as it is possible to build one up from the rather fragmentary materials in existence. Then follow several appendices:—

A. *Don's "Reputed Discoveries"* analysed, with the result that eight are shown to have been rediscovered in Scotland, under conditions that render Don's accuracy at least very probable; nine

were evident casuals; three have become extinct owing to cultivation or drainage; thirteen were misnamed, usually by Sir J. E. Smith, and ten remain open to "grave suspicion of error."

B. *Don's Admitted Discoveries.*—These include numerous additions to the British flora, others to the Scottish, and very many to the county records.

C. *George Don's Herbarium Britannicum* gives a *verbatim* copy of the labels on the several specimens (225 species in all, of which 52 are cryptogams) issued for sale.

D. *George Don's Private Herbarium* also gives *verbatim* the labels on the plants, chiefly *Graminaceæ*, with a few *Cyperaceæ* and *Juncaceæ*. Among the specimens are several both rare and interesting. The names given by Don are corrected where inaccurate.

E. *Observations on some of the Indigenous Grasses of Britain, which seem deserving of Culture for Pasture or Hay*, reprinted from "Trans. Highland Soc. of Scotland," vii., 1807.

F. *Account of the Native Plants in the County of Forfar and the Animals to be found there*, reprinted from Headrick's "General View of the Agriculture of the County of Angus or Forfarshire," 1813. In this are enumerated the species known to him, including cryptogams as well as flowering plants, the rarer and more lately discovered forms being specially picked out, and the more interesting forms of certain localities enumerated together. A considerable number of casuals and some evident errors appear in these lists.

G. *Letters from G. Don to N. J. Winch*, and from George Don, Jr., to Dr. Neill.

From these various sources, supplemented by footnotes contributed by Professor Balfour, one can form a conception of the man, of his devotion to the investigation of the Scottish flora, of the difficulties that beset his way and that would have appeared insurmountable to one of less resolute spirit, of the share that his personal peculiarities had in adding to his difficulties, of the limitations under which he worked, and of the causes, certain or very probable, that vitiated the accuracy of some of his records, both those published by himself and those in J. E. Smith's "Flora," and that were held to justify an estimate of his work too often very unfair to him; and one can realise how great were the actual results of his labours, and how much more admirable in face of the difficulties to be overcome. There is surely little, if anything, more to be said on Don's life and work, and Mr. Druce deserves hearty thanks for what he has done so fully and well.



THE LATE REV. JAMES KEITH, LL.D.

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REV. JAMES KEITH, LL.D.

On Friday, 11th August 1905, after a short illness, the Rev. Dr. Keith died at his residence in Forres in the eightieth year of his age. Born in Keith on 23rd December 1825, he attended the parish school there; and, like many another lad, he went direct from the parish school to the University in Old Aberdeen, King's College (then distinct from, and a rival of, the University of Marischal College in Aberdeen), and graduated M.A. in 1845 after a successful curriculum. He thereafter spent some months as a tutor, and in 1846 became schoolmaster of Knockando in Elginshire. This post he held while studying for the ministry in the Church of Scotland; the system, then allowed, of partial sessions permitting him to put in the necessary attendances at King's College, but extending his course to six years. In 1852 he was appointed to the parish church of Grantown, but remained there only until the following spring, when, at the request of the members of the church of Forres, he received a presentation to the parish of Forres. There he spent over half a century, esteemed and honoured by all, and held in warm affection by those who had the privilege of his friendship. He took a very great interest in all that concerned the welfare of Forres and its inhabitants,

keeping himself free of all narrowness, and ready to assist in every work. He was for many years Chairman of the School Board, and also was Chairman of the Managers of the Leanchoil Hospital; nor did he spare himself where he could render service to any public cause. His death is felt as a great loss to the community.

Not robust in youth, his studious life told on his health, which for a time was not satisfactory. Fortunately his medical adviser, Dr. Innes of Forres, was interested in natural history, and sent him, as the prescription best suited to his needs, a botanical case and a flora, with the advice to use both regularly. He did so and soon acquired a love of natural history, and especially of plants, that grew ever stronger and that enabled him to make valuable contributions to the study of the flora of the Province of Moray. The early volumes of the "Scottish Naturalist" contain very excellent lists by him of the 'Mosses found in the Vicinity of Forres' and of the 'Fungi of Morayshire,' and short botanical notes. He aided others with his knowledge and with specimens most willingly, and was recognised as one of the most accurate mycologists in Scotland. The "Mycologia Scotica" and "British Hymenomycetes" of the Rev. John Stevenson, LL.D., and the "British Uredineæ and Ustilagineæ" of Dr. Plowright bear testimony to the worth of Dr. Keith's researches, as do also the well-known papers by Mr. Berkeley in the "Annals and Magazine of Natural History." He discovered a number of additions to the British lists of fungi, of which some were new to science, and of which *Polyporus Keithii*, B. and Br., and *Peziza Keithii*, Phil., commemorate him.

He took a keen interest in the Forres museum, and contributed both personal services and specimens to it. Despite his age he took part enthusiastically of late years in the work and excursions of a Field Club in Forres of which he was president.

In 1882 the degree of LL.D. was conferred on him by the University of Aberdeen, in recognition of his merit as a naturalist and of his public services. In 1899 Dr. Keith was relieved from the active duties of his ministry, an assistant and successor being appointed to the charge; but he con-

tinued to reside in Forres, where he was much esteemed. He was predeceased by Mrs. Keith, who died in 1898.

He will live in the memory of his friends as one loved and honoured for his unselfish and upright character, his kindness of heart, and his ability. The accompanying photograph was taken about two years ago.

NOTES ON THE ORKNEY VOLE.

By Robert Godfrey, M.A.

During a recent visit to Orkney Mr. H. Drummond Simpson and I spent a considerable part of our time in hunting for micro-mammalia. On the day of our arrival at Stromness, August 8, we visited the Black Craig and found the vegetation on the upper slopes of the hill tunnelled in every direction by the runs of the Orkney Vole (*Microtus orcadensis*, Millais.) The upper portion of the Black Craig is a typical hill-pasture, covered with a dense growth of wiry sedges, interspersed with ling, bell-heather, and crowberry (*Empetrum nigrum*), and dotted profusely with grass of Parnassus, cotton-grass, ragwort, scabious, and other plants. Through this dense vegetation the runs extend to the very crest of the hill, running in main thoroughfares up the hill-side, or across its brow for hundreds of yards, and sending off side-paths to traverse in intricate fashion the various mounds adjoining the main routes. In the better-clad portions of the hillside the runs were often completely hidden beneath the thick crowberry growth, but usually they were quite apparent to the eye. Periodically the run would disappear in the soil, passing through an obtruding turf, or making a deliberate descent for some inches into the ground to provide a more secure shelter for the creatures. The runs measure from two inches to two and a quarter inches in diameter, a trifle broader than the transverse measurement across the vole's face from whisker-tip to whisker-tip. We disturbed our first Vole on the summit of the Craig from an underground passage at which we had begun to dig, and forcing it to leave

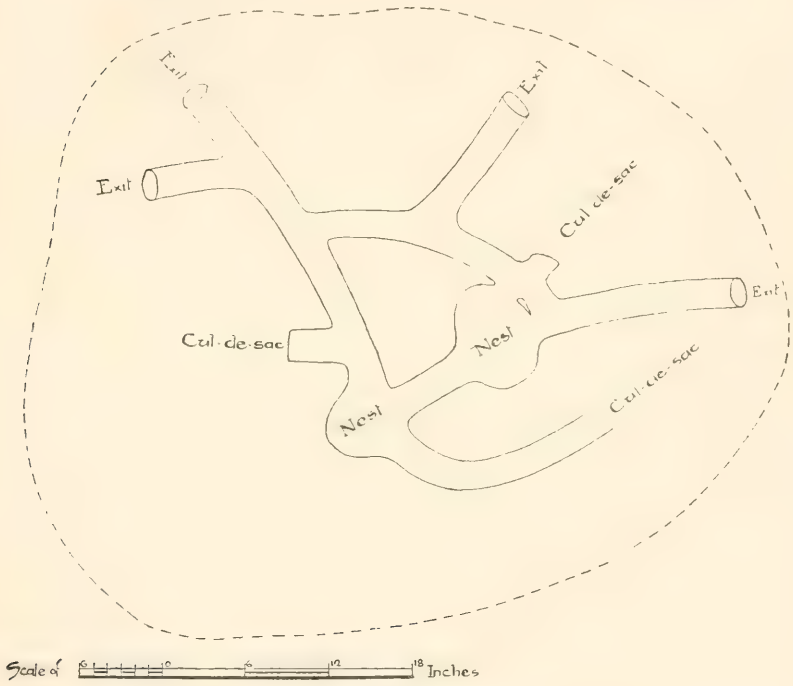
its run we caught it as it tried to escape over the rough vegetation. We set our traps in the runs, and easily obtained specimens; some of the Voles were probably trapped in the course of their ordinary wanderings, but others undoubtedly came to the cheese which we were using as bait.

The thickly-populated haunts on the Black Craig are in the drier parts of the hillside, but in a valley behind Stromness, locally known as the Looms, we found the Voles common in soft, marshy ground where peat-cutting has long been in progress; here also the Voles inhabited the drier mounds, but their runs were distinctly shown on the wet ditches as well as on the dry ground.

In South Ronaldsay, as on the mainland, the main haunts of the Orkney Vole are on the hillsides and along the borders of the ditches. We did not, however, see such runs as we had met with around Stromness, but we learned that the Vole was common on the island and well-known as the "Cuttick" to the inhabitants. Miss Annie Allan of Burwick Farm brought us one that had been captured by the herd-boy with the aid of a dog on August 16; and we ourselves trapped one in Burwick Churchyard, where the prevailing plant was the tall docken, and where the height of the wild vegetation hindered us from seeing anything in the nature of runs at all. In Burwick Churchyard the Vole was the companion of the Lesser Shrew and of a very dark form of *Mus musculus*.

We were very anxious to obtain a nest of the Orkney Vole, and were at length put on the right scent by Mr. George Ellison, Liverpool, who had seen a dog unearth one in a little mound. Mr. Ellison and I spent the evening of August 23 in the Looms behind Stromness, and succeeded in discovering the nests. These are placed in the centre of a small mound overgrown with vegetation, and have several approaches which prevent the animals being caught unawares. We dug up and traced out the various routes, and carefully measured the same; Mr. Ellison then drew out to scale the plan of the Vole's fortress which is here reproduced. In the one mound there were two nests, separated by a distance of six inches. The larger was oval-shaped, composed entirely of fine hay in a dense mass, and measured eight inches in length by five in breadth towards one end, and three in

breadth towards the other. From the size and the condition of the nest it was evident that it had seen some service—though whether as a cradle for the young, or as a shelter for the adults could not be determined—but it was empty when laid bare by us. The other nest was rounder in outline, measuring five inches across ; it contained some new material but was also empty. Each nest formed a thick lining in a



PLAN OF NESTS OF ORKNEY VOLE.
(The dotted line represents the base of the mound.)

carefully prepared hollow excavated by the Voles in the peaty soil, and was of the nature of a flattened ball inside which the old Vole and her young might securely lie. At one of the four entrances some peat freshly dug out led us to the discovery of the nest.

Probably the breeding-season extends over several months : the first females captured by us, August 8 and 9, contained embryos the size of peas.

We caught a female on August 8, which had assumed an inky black pelage, by losing the dark brown tips of the long hairs, on the hinder back and between the ears.

CUMBERLAND STREET, EDINBURGH.

ON THE HOUSE MICE OF THE OUTER HEBRIDES.

By WM. EAGLE CLARKE.

MY friend Mr. James Waterston in forwarding a House Mouse which he had captured at Lochmaddy, North Uist, in June last, called my attention to the light colour of the under surface of the specimen. Since then I have been able to institute a comparison between this specimen and a number of examples of the St. Kilda House Mouse, *Mus muralis*, Barrett-Hamilton[1] (also sent to me by Mr. Waterston), and it seems to me that the North Uist Mouse belongs to that species or race. It is practically identical in colour and size, but is slightly paler in the tint of the under surface than in the St. Kilda specimens, which are about a score in number, while in size it equals the largest of them, its total length being 7.3 ins. (134 mm.), of which the head and body measure 3.9 ins. (99 mm.).

Mr. Waterston has since informed me that he found this large, brown-coated, buff-bellied Mouse quite common in houses at Lochmaddy, where its peculiarities were well-known to the inhabitants, and where too the typical form of House Mouse (*Mus musculus*, Linnæus) also commonly occurs. He did not, however, see any hybrid specimens between the two forms, though it seems likely that such crosses might occur.

The presence of *Mus muralis* in one of the large islands of the main Outer Hebridean chain, like North Uist, would not only rob that species of the extreme insular peculiarity which has hitherto been assigned to it, but it suggests that

[1] See "Annals," 1899, pp. 129-140.

it, or a very closely allied form, may, on full investigation, be found to be a more or less prevalent race of House Mouse throughout the group generally. The only other House Mice I have seen from the Outer Hebrides came from Breasclet on the west side of the Island of Lewis, and they were ordinary examples of *Mus musculus*.

The object of these preliminary remarks is to call attention to these hitherto overlooked but interesting facts relating to the Hebridean House Mice, in the hope that they may be the means of stimulating necessary investigations, including the collecting of specimens between Barra Head to the Butt of Lewis. I shall be glad to examine and report upon specimens submitted to me from any of the Hebridean Islands.

NOTES ON THE MICE AND BIRDS OF ST. KILDA.

By James Waterston, M.A.

The following notes were made during a stay in St. Kilda from the 11th of June to the 10th of July.

Mus hirtensis.—On the evening of the 17th a search was made for runs of this Field Mouse, but with little success, though in the morning a well defined track had been seen among some luxuriant grass on the N.E. slope of Connacher. As a rule the only indication of the presence of mice was a slightly worn spot opposite a hole, either in a dyke or under a stone. On Dun there was noted a clear path running round a boulder and ending in a burrow beneath it. *Hirtensis* seems to spend most of its time in the neighbourhood of cleits,[1] pens, dykes, etc. On Hirta it is very shy in its habits, and though I spent several nights in the open it was never detected far from refuge, *i.e.* never on the bare hillside. Had it been present in such situations it would certainly have been noted, for in June there was virtually no night. During the day it was never seen except once on

[1] Small oval stone buildings scattered over the hills, and used for storing corn, hay, and peat.

Dun—its habits, therefore, are nocturnal. It began to move about at dusk, 10.30 to 11 o'clock, and from that time to midnight most of my captures were made. The species feeds largely, if not exclusively, on grass and various seeds—the stomachs in the case of a score or so examined being filled with a greenish pulp. Of baits meal and biscuit were taken freely, whereas cheese, in my limited experience, was a complete failure.

With regard to trapping it was found that the most productive spots were cleits, especially when filled with hay. Traps laid in the open never brought a single mouse. The bait was frequently attacked by *Forficula*, *Oniscus*, and *Arion ater*, the last springing many traps. More serious were the depredations of the gulls, who sometimes took away mice, sometimes both mice and traps.

The species is distributed fairly commonly round Village Bay and in the glen. On Dun it is abundant, and the men who sometimes sleep in a semi-underground house there say that at night the mice run over their bodies in numbers. They are agreed that no mice occur on Boreray, while as to Soay no evidence was forthcoming.

Two nests were discovered, neither of them typical. The first was discovered on the lower slope of Oisaval while a boulder was being examined for spiders. It had no external opening nor any indication of the presence of a mouse. Between the lower surface of the boulder and the hillside there was a V-shaped gap, one corner of which was filled by a large tuft of carex. Its leaves did not quite reach the stone surface, but grass had been blended with them to fill the space. This outer layer surrounded a central mass of similar material bitten into short lengths and very soft. When all the nest was removed a small burrow appeared leading into the hill. Dimensions about 10 ins. by 4 ins.

The second was in Dun, and situated in a turfy bank about 2 feet in. The main burrow led to a Fork-tailed Petrel sitting on her egg, and just before it reached this a branch broke off to the left, to another, probably disused, petrel nest. The whole flask-shaped ending and part of the burrow itself were filled with chopped grass finer than in the previous example. This mouse nest was separated by the

thinnest partition from a sitting Puffin. The men told me that mice and petrels frequently inhabit the same holes.

Several ♀s were dissected, and the average number of embryos or fœtus was six. One uterus contained only two—in the same cornu. No early stages seen.

The ♂♂ outnumber the ♀♀. In my experience this is as 2 : 1.

Both sexes appear subject to disease, and the liver especially was frequently in an unhealthy state. It was to be seen spotted by colonies of *coccidia*. But its most interesting parasite was a Cestode. This appears at first as a small transparent yellowish cyst near the surface of the liver. It gradually works its way in till the whole lobe is affected. Sometimes only the Spigelian lobe escapes.

The people say this mouse on Dun is subject to variation in colour. I saw no piebald mice, but Finlay M'Quien brought me a young specimen from the top of Connacher which had some white markings.

The largest example taken was exactly 9 inches—body, 5 ; tail, 4. In general, the following features of *hirtensis* impress one :—Its size ; the length and tenderness of the tail, which sometimes breaks if the animal be lifted by it ; the great development of the pes ; the vole-like texture of the fur.

Mus muralis.—To this species less attention was given. It swarms in all the houses and occurs in cleits within the cultivated area. By supplying boys with traps I procured as many as I wanted. It varies greatly in size and coloration of the belly, which is sometimes smoky and again a lovely creamy yellow. It is omnivorous and very prolific. Young, 6-9, in one case 10 fœtus were observed, but one seemed unlikely to develop fully.

I append a few remarks on the more noteworthy birds seen during the month. Of the regular breeders in the group all were observed except the Peregrine and the Storm Petrel.

Common Swallow (*Hirundo rustica*).—On the 14th June one was hawking flies in front of the village.

House Martin (*Chelidon urbica*).—One noted on the evening of 17th June, and another a week later.

White Wagtail (*Motacilla alba*).—On the 24th June one was seen at the bottom of the glen among stones in the burn channel.

Snipe (*Gallinago cœlestis*).—Heard drumming on upper slopes of Mullach Mor on 14th June.

Dunlin (*Tringa alpina*).—Heard near Ruaval on 13th June.

Whimbrel (*Numenius phœopus*).—Seen singly and in pairs, also heard often during week ending 17th June in various places from the glen to Village Bay. Latterly I took daily note of this species in the marsh and on the foreshore near it. One collector told me he had taken and sold the eggs. About five or six pairs were resident this summer. Reported as common on migration.

Lapwing (*Vanellus vulgaris*).—On 19th June I saw one at Ruaval, fighting with a Hooded Crow. It disappeared over Dun. Shortly afterwards another was seen on ridge farther N.E.

Heron (*Ardea cinerea*).—Noted in flight from Dun. Going in S.E. direction to Uist on 27th June.

Great Shearwater (*Puffinus gravis*).—On the 5th July one was floating dead behind Dun; on the 8th another in same locality, rather more decomposed than the first. Mr. Godfrey measured this example and found its length to be 20 ins.

Common Gull (*Larus canus*) and Cormorant (*Phalacrocorax carbo*).—Were never seen.

Meadow Pipit (*Anthus pratensis*, L.).—I do not think this bird *breeds* on St. Kilda. On Mullach Mor some suspicious-looking Pipits were observed on the 8th July, but after procuring one Mr. Godfrey had no hesitation in determining it as a Rock Pipit (*A. obscurus*). It was somewhat lighter on the breast.

On a ledge of the cliff on N.E., I one day found two casts containing mouse fur and the elytra of beetles (*Carabus*, sp.). They reminded me strongly of the Kestrel (*F. tinnunculus*), to which they were probably due unless some of the gulls in Hirta have taken to a coleopterous diet. Considering the abundance of other food this is unlikely.

Edinburgh.

REPORT ON SCOTTISH ORNITHOLOGY FOR 1904.[1]

By John Paterson.

In contrast to the weather of the preceding year, which presented some striking features, that of 1904 followed tradition—March dry and cold, April the wettest month of the year, "winter lingering in the lap of May," and so on.

In 1903 spring migration began early, but got a memorable set back from the long-continued inclemency of April. The writer must always recollect that month as the first of its kind in which he had ever failed to hear the welcome cadence which constitutes the song of the Willow Wren, and no doubt, in some such way, the spring of 1903 will have impressed itself on the minds of other Scottish ornithologists. The year 1904 has no such unenviable distinction. Its ornithological features, as far as they are revealed, chiefly by the communication, most obligingly sent in by the light-keepers, and by correspondents to this Journal and to the writer, are here set down in specific order.

Turdus musicus (Song-Thrush).—The principal spring movements occurred between 22nd February and 20th March. On the 8th of March 200 were observed at Burntisland, the wind being easterly, and the weather dull. These birds dispersed during the day. The principal autumn movements were between 12th October and 1st November.

T. iliacus (Redwing).—Last seen on the mainland in several localities between 1st and 3rd April, a great rush is reported at the Flannans on 12th and 15th. First appearances on the mainland in autumn are reported from Kirkliston, 8th, and Beith, 13th October. During the whole of that month and until 8th November, reports from lighthouses generally speak of its abundance.

[1] This Report has been written on new lines. We cordially endorse Mr. Paterson's hope that in future the information communicated may not be confined to records of occurrences only. There are other features, such as extension of range, weather influences, habits, etc., which might with advantage be incorporated. We hope it will be possible in future Reports to give the names of those who have contributed information, and we desire to place on record our appreciation of Mr. Laidlaw's valuable services in the preparation of the Reports for 1898 to 1903 inclusive.—Eds.

T. PILARIS (Fieldfare).—Generally reported from mainland localities in second half of April, and a large flock was still at Kirkmuirhill, Lanark, on 3rd May, but the lighthouse returns throw no light on its departure in spring. In autumn first observed on the mainland at Portobello, 7th October, and Higham, Fife, 13th October, and at lighthouses generally from 22nd October (Flannans) till 11th December (Corsewall), when immense flocks with Starlings were observed along shore. At the East Neuk of Fife, on 5th November, several flocks came in from N.E. against a strong westerly wind "pretty well dead beat."

T. MERULA (Blackbird).—The lighthouse observations on this species are chiefly from West Coast stations from 22nd and 23rd February, on which dates great numbers passed Corsewall, till 12th April at Skerryvore and the Flannans. It was nesting at Lerwick on 21st April, and from Beith Mr. Matthew Barr sends an account of one which laid four eggs in a hole of a wall on the bare stone and lime, the nest intended for their reception having been torn out by some malicious boys. At Blackwood, Lanark, on 26th October, many were collecting in the hedges, "after this date far fewer to be seen." The principal autumn movements reported begin at Corsewall, 15th October, Monach and Noup Head, 16th October, and continue intermittently till 20th November (Skerryvore), and 10th December (Flannans).

T. TORQUATUS (Ring Ouzel).—Reported in spring from Corsewall, Skerryvore, and Lagg (Arran) on 12th April, and Blackwood, Lanark, on 17th.

SAXICOLA ŒNANTHE (Wheatear).—Appeared as usual at Lendalfoot (Ayr) on 22nd March, is reported from Millport, Bute, on 31st, and Sule Skerry, 1st April. The only autumn records after September are from Fairlie, Ayr—two on 1st, and Largo, Fife—one on 19th October.

PRATINCOLA RUBETRA (Whinchat).—Appeared Halmyre (Peebles), 19th, Lamlash (Arran), 26th April, and Thornliebank (Renfrew), 1st May. Mr. Barr, Beith, mentions a clutch of six eggs of this species seen this season, all speckled at the *thin* end.

RUTICILLA PHŒNICURUS (Redstart).—On 30th March one was seen in a garden at Lerwick. Next reports are Corsewall, 12th; Unst, 19th; East Linton, 21st; Halmyre, 22nd; Carmichael, (Lanark), 24th April. In the middle of May I found it pretty common on the skirts of the deer forest at Inveraray, and in the woods up the Aray.

ERITHACUS RUBECULA (Redbreast).—Reported from Corsewall on 29th March; Lerwick, 3rd and 19th April; and on 28th

September, and 20th November (2) at Corsewall; and 24th November, Lerwick. One appeared at Beith in the autumn with a few white feathers in the head, and nearly a white ring round the neck.

Sylvia cinerea (Whitethroat).—Quite exceptional is the appearance of this species in Lerwick on 15th April. Even the occurrence at Thornliebank, Renfrew, on 30th, was out of the common, because the next seven reports from as many localities refer to the second week in May. This bird, Mr. Barr of Beith says, is, he believes the earliest to begin nest-building on its arrival. "I have noticed for many years now, that when first I hear his welcome song, if I take the trouble to search, I am always sure to find his nest."

Sylvia curruca (Lesser Whitethroat).—One shot at the Flannans, 23rd September, sent for identification.

S. atricapilla (Blackcap).—It is desirable that we should have more information regarding the appearance of this and the next species in summer. Hitherto the reports have been meagre, and there is no improvement this year. At Thurso, on 31st October, an adult ♂ was killed by a cat, while from Barra three are reported on 5th (♀), 11th (♂), and 17th November respectively.

S. hortensis (Garden-Warbler).—At Inveraray, on 19th May, two which I saw were in song. Kirkliston, 20th, and Thornliebank, 22nd, are the next reports. At the last-named locality, on 30th May, Mr. John Robertson found a nest containing five eggs, two days incubated. At Flannans on 18th September.

Regulus cristatus (Goldcrest).—Spring reports are from Skerryvore, 24th March, "several"; Corsewall, 12th, Barra, 15th April; and Unst, 15th to 23rd April. In autumn, 28th September, Corsewall; 16th October, Pentland Skerries; and 20th, Bell Rock. Mr. Barr, who had the opportunity of watching the lining of a nest of this species this summer, says the male carried no material, but piped his best to accompany his mate with every beakful of building material brought by her.

Phylloscopus rufus (Chiffchaff).—Reported in spring from Lamlash, 16th April.

P. trochilus (Willow-Wren).—The earliest reports of the appearance of the Willow-Wren are from the south-west:—Corsewall, 12th, Blackwood (Lanark) and Beith (Ayr), 14th April. On the 15th it is reported from other four localities, and from two to four days later reports speak of its abundance, even in Unst, where were many on the 19th. From its great numbers and wide distribution this is a good species for judging the course of the spring migration by, and its normal appearance, as in this

year, indicates normal conditions. Autumn reports are few, the latest being Largo, 26th September, one bird only observed.

P. SIBILATRIX (Wood-Wren).—Appeared Lamlash (Arran), 29th April; Gifford, 4th May.

ACROCEPHALUS PHRAGMITIS (Sedge-Warbler).—An early date is given from Halmyre (Peebles), viz. 24th April; the next being from Ayr and Beith, 7th and 8th May respectively; Auchinblae, Forfar, 10th; Duddingston and Kirkliston, 11th.

LOCUSTELLA NÆVIA (Grasshopper-Warbler).—Only reported from Beith, the date 15th May, which is late.

CINCLUS AQUATICUS (Dipper).—Messrs. K. and R. M. Buchanan write:—"Found a Dipper's nest on 17th April, and removed therefrom a clutch of absolutely fresh eggs. Seven days later revisited the locality, and remarked that the same or another pair had commenced to build in a situation distant not many feet from the one previously occupied. On 22nd May were again in that district, and found nest completed and five eggs laid, and that the birds, probably owing to dampness, had deserted it and built another nest, using the abandoned structure as a foundation. The upper nest contained five eggs, upon which one of the birds was closely brooding."

MOTACILLA LUGUBRIS (Pied Wagtail).—The lighthouse returns in nearly all cases only record single birds. At inland localities which it leaves for the winter it reappeared at Carmichael, 5th February; Kinnelhead, 20th March; and "migrating Pied Wagtails" were "noticeable" at Duddingston, 17th April. Again at Edinburgh, 27th July, large numbers appeared. In August, at Fairlie, Mr. Robert Wilson got an albino of this or the next species.

M. ALBA (White Wagtail).—There are no East Coast records whatever. The spring passage is reported from seven "Clyde" localities, beginning at Dalbeth, Lanark, 12th April, one ♂; reaching its maximum, 30th, at Irvine, on the coast of Ayr, where two dozen were seen; and the last appearance is at Inveraray, 15th May. It is reported from Barra on 15th April. The only autumn reports are from the Flannans, where Messrs. Clarke and Laidlaw found it abundant from 6th to 22nd September, and it was still there the day after their departure.

M. RAII (Yellow Wagtail).—Arrived 16th April, Beith; 19th, Govan (3); and at Bishop Loch, Lanark, on 21st, a dozen ♂ and ♀.

ANTHUS TRIVIALIS (Tree-Pipit).—Reported from Halmyre (Peebles) and Kirkliston on 19th; Gartcosh (Lanark), 21st; and Beith, 23rd April.

A. PRATENSIS (Meadow-Pipit.—A number seen at Pentland Skerries 20th March, reappeared, Carmichael (Lanark), 30th March, and was numerous at the Flannans, 20th May. Reported from lighthouses all round the coasts in autumn between 18th August (Sule Skerry), and 28th October (Bell Rock). At Beith, Mr. Barn found a nest with *six* eggs.

A. OBSCURUS (Rock-Pipit).—An albino was secured at Barra on 1st September.

LANIUS EXCUBITOR (Great Grey Shrike).—One (♂) shot in May, near Rumbling Bridge. ("A.S.N.H.," 1904, p. 244).

AMPELIS GARRULUS (Waxwing).—At Nethy, Inverness-shire, in January, a flock of forty or fifty, which gradually disappeared, though four were still to be seen in the first week of May. ("A.S.N.H.," 1904, p. 188).

MUSCICAPA ATRICAPILLA (Pied Flycatcher).—Pentland Skerries, 6th, 7th May; Colinsburgh, 8th; North Berwick, 8th, 9th, a good many; Tentsmuir, 9th; Largo, 12th. At Flannans, 13th September; Pentland Skerries, 14th; Barra, 17th; and Flannans 20th.

M. GRISOLA (Spotted Flycatcher).—Halmyre, 4th May; Burntisland, 9th; Lamlash, 15th, in pairs; Dundrennan 5th June, in passage; Strathyre, 31st May, three eggs slightly incubated. Latest autumn date, Duddingston, 16th September. Mr. Barr, Beith, writes that the earlier nests found by him in 1904 contained from four to five eggs, but in July he saw six nests each with *three* eggs.

HIRUNDO RUSTICA (Swallow).—On the Clyde at Carmichael on 13th April, 200 Swallows and Sand Martins, at Noup Head (1), and at Beith, same date, and on 14th at Cloverhill and Cramond. At Kirkliston and Hunterston (Ayr) on 15th October, and Dunbar, 5th November.

H. URBICA (House-Martin).—Dundrennan (Solway), 18th (1); Burntisland, 21st (several); Kirkmuirhill (Lanark), 28th; Halmyre, 29th April, "very late this year." Most records refer to first week in May. Last seen Kirkliston, 4th October.

COTILE RIPARIA (Sand-Martin).—First spring record, Whiting Bay, Arran, 29th March; next East Linton, 4th April; and from eight mainland localities between 13th and 30th April; Lerwick, 17th May (2), 25th (2). See under Swallow above.

COCCOTHRAUSTES VULGARIS (Hawfinch).—One at Tyninghame, February; one at Skerryvore, 28th April; one Unst, 3rd May; one Peterhead, 20th July. ("A.S.N.H." 1904, pp. 126, 157, 187, 244.)

CARDUELIS SPINUS (Siskin).—Unst, Shetland, 19th April, one or two.

Fringilla cœlebs (Chaffinch).—Increased numbers on 17th March at Unst. Pentland Skerries 21st October, flock; Barra, 30th October; Flannans, 10th November (50).

F. montifringilla (Brambling).—A great many in Unst from 16th April till 27th May, also reported from Whalsay (Shetland), 19th. First autumn appearance, 27th October, Carmichael (Lanark). Several in Aros Woods, Mull, 22nd November.

Linota linaria (Mealy Redpoll).—One "limed" in November, at Beith (Ayr).

Plectrophenax nivalis (Snow-Bunting).—Very few notices of this species on the mainland have been received. The last spring mainland observation is 3rd April, at Girvan, where I saw a dozen on the shore north of the town. The earliest mainland autumn occurrences are from Fife, 11th October, Largo (1); 5th November, East Neuk (5); and the only "large flock" is recorded in the same schedules, St. Andrews, 19th January. At the Flannans the chief movements were in winter from 29th September till 13th December. At North Ronaldshay "large flocks" occurred on 22nd February and 29th October, while at Sule Skerry the largest numbers seen were on 31st March (40), and 11th November (80).

Calcarius lapponicus (Lapland-Bunting).—As already recorded ("A.S.N.H." 1904, p. 207). Messrs. Clarke and Laidlaw found a flock on the Flannans during their stay from 6th till 21st September, and several were seen on Sule Skerry on the 22nd.

Sturnus vulgaris (Starling).—In January Starlings are recorded as being in considerable numbers at Inverbroom, having remained all winter for the first time. The only Lighthouse notice of importance in spring is a great rush at the Flannans on 15th April, wind S.E., light-breeze, hazy, and rain. There are many reports in winter from the Bell Rock north about by Sule Skerry to the Flannans, Monach, and Corsewall, but only at the last named are the numbers other than trifling. On 11th December at Corsewall there were immense flocks along the shore.

Garrulus glandarius (Jay).—About fifteen shot in the Luss district of Loch Lomond between May 1903 and May 1904.

Corvus monedula (Jackdaw).—From Beith a partial albino is reported, having the head and body light slate-colour, the flights and tail feathers white tinged with cinnamon.

C. frugilegus (Rook).—In Unst a small flock on 14th February. Numbers greatly increased there 23rd March, and on 20th April enormous numbers over whole island; last seen 10th

May. ("A.S.N.H.," 1904, p. 156). Several at Lerwick 30th and 31st March, and immense flocks at Corsewall on 3rd and 12th November. At Beith a pair persisted in occupying a chimney-pot on a dwelling-house. After the material for the nest had been removed several times, one of the pair was destroyed, which tragedy ended the experiment.

Alauda arvensis (Skylark).—From all stations round the coasts small parties are reported throughout February and March, but the only great rush (with other species), and the *only* April report, is from the Flannans on 15th. There are no reports from May till August. From September till the end of the year reports are not so numerous as in the first months, and the only large number is at Noup Head on 7th October.

A. brachydactyla (Short-toed Lark).—One (♀) captured on the Flannans, 20th September ("A.S.N.H.," 1904, p. 206).

Cypselus apus (Swift).—Earliest records are on 5th May from Lamlash, Cameron Bridge (Fife), and Inverleith; Dunure (Ayr), 7th, and Beith, 8th. In autumn at Duddingston, 13th September in numbers; Auchtertool and Noup Head, 16th; Flannans, 16th and 17th; and Kirkliston, 18th, forming an unusual series of mid-September observations on this species.

Iynx torquilla (Wryneck).—One found dead, 9th May, at Dunbar, ("A.S.N.H.," 1904, p. 244).

Caprimulgus europæus (Nightjar).—Lamlash, 4th May, and nightly thereafter when quiet.

Dendrocopus major (Great Spotted Woodpecker).—One at Auchinblae (Kincardine), 16th June.

Alcedo ispida (Kingfisher).—Two occurrences are reported from far north, (1) Inverbroom, 19th September; (2) Brawl Castle (♀), 19th October, picked up dead at river side. On the Clyde near Glasgow, on 12th April, twenty minutes after sunset, I heard one singing, a regular warble with the call note appearing time and again in the measure.

Cuculus canorus (Cuckoo).—The earliest dates are from "Clyde," viz. Lamlash, 25th; Beattock, 26th; Beith, 28th April; Auchinblae (Kincardine), 29th; Cloverhill (Tweed) and Fossaway (Forth), 30th, are the next reports, but the majority of the observations of first occurrences are between 2nd and 4th May.

Asio accipitrinus (Short-eared Owl).—Four observed at Teasses (Fife), 10th March. They had been there all winter in consequence of a plague of field voles. They did not breed.

Circus cyaneus (Hen-Harrier).—Near Stromness, 2nd February, (♂); Stenness, 26th February (♀).

Buteo lagopus (Rough-legged Buzzard).—Dunbeath (Caithness), 1st January (♂); Braemore (Caithness), 1st April (♀); Auchinblae (Kincardine), 10th April (2), 15th August (2), 29th October (2).

Falco subbuteo (Hobby).—One (♂) shot at Kelso, 29th June ("A.S.N.H." p. 245).

F. tinnunculus (Kestrel).—One at the Flannans, 29th September.

Phalacrocorax carbo (Cormorant).—Mr. H. W. Robinson, who was paying close attention to the change of plumage in spring in this species near Stromness, says it was the 27th of February before he saw one in full breeding plumage.

P. graculus (Shag)—Mr. Robinson, writing of his observations on this species near Stromness, says that on 25th January, "some had a fairly large crest, on 4th February several almost fully crested, and on 22nd February shot one with a fully developed crest on the forehead, and another smaller crest on the back of the head."

Ardea cinerea (Common Heron).—One at Noup Head on 5th September, "seldom seen here," and four on 23rd flying N.E. At the Flannans five on 12th, one on 17th September, and one on 12th October.[1]

Anser cinereus (Grey-Lag Goose).—At Dundrennan (Solway) on 15th February, 50 flying W. to E.

A. segetum (Bean-Goose).—Flock at Burntisland on 1st February, out of which two shot were of this species.

Bernicla leucopsis (Barnacle-Goose).—Arrived Barra, 4th October, Flannans on 6th (5), 12th (24).

B. brenta (Brent Goose).—On 2nd January at Fairlie, Ayr, 100. On 16th September, one, Flannans. On 17th October at Sule Skerry, 18.

Cygnus (*sp.?*) (Swans).—Near Stromness, 29th February and 1st March, Whoopers (*C. musicus*), small parties passing; 16th and 18th June at Tentsmuir, flock; 19th April, Whalsay, Shetland (19); 23rd April Sandsting, Shetland (11); 8th November, North Shetland, heard passing ("A.S.N.H." 1905, p. 118).

[1] A nest at Kirkconnel which contained four eggs precipitated to the ground with the top of the tree, which was blown off by a gust of wind—an exception to the rule that birds usually select safe trees for nesting. General hatching took place at Rosneath Heronry on 9th April.

ANAS STREPERA (Gadwall).—One (♂) early in the year near Stromness, shot out of flock of Wigeon. Another 22nd March at Novar ("A.S.N.H." 1904, p. 189).

SPATULA CLYPEATA (Shoveler).—One at Lendalfoot, Ayrshire, on 24th October the first ever obtained there. One in Bute, 8th May, an addition to Mr. Robertson's Bute list ("A.S.N.H." 1905, p. 54).

FULIGULA FERINA (Pochard).—First small flock at Duddingston 18th September.

F. CRISTATA (Tufted Duck).—First small flock at Duddingston on 5th September.

HARELDA GLACIALIS (Long-tailed Duck).—Near Stromness, numerous both on the sea and inland lochs, but only in flocks on the former. Started pairing 4th February. Arrived Barra, 23rd October.

SOMATERIA, *v.* NIGRUM (Pacific Eider Duck).—Shot at Graemsay, Orkney, 14th December ("A.S.N.H.," 1905, p. 183).

S. MOLLISSIMA (Common Eider Duck).—At Sule Skerry, 2nd February, twelve seen, "seem pairing." "Last seen" at the Bell Rock on 10th April. At Loch Broom six pairs, the *first* seen there ("A.S.N.H.," 1905, p. 54). Appeared in force for the *first* time in the spring of 1904 at Scourie Bay, and three males and two females on 11th May are the *first* recorded occurrences of the species for Loch Inver ("A.S.N.H.," 1904, p. 189). At Noup Head on 3rd July they returned (11). On 30th September at the Bell Rock, fifteen were observed, on 6th October, forty-two, and by 27th October, about a hundred.

ŒDEMIA NIGRA (Common Scoter).—At Largo Bay on 26th December, thousands, being the first appearance in numbers.

Œ. FUSCA (Velvet Scoter).—Some at Largo Bay in the great flocks of the common species in December.

C. ŒNAS (Stock Dove).—One at Halligarth, North Shetland, 22nd to 25th June ("A.S.N.H.," 1905, p. 117).

LAGOPUS MUTUS (Ptarmigan).—Two young, perfectly white, found near Roy Bridge ("The Field," 20th July, 1904, p. 230).

COTURNIX COMMUNIS (Quail).—At West Ardow, Mull, 29th October ("The Field," 1904, p. 864).

CREX PRATENSIS (Corn-Crake).—One shot, 18th January, on Tiree, where they are "often got in winter." At Dippen, Arran, Mr. Robert Lindsay flushed one on the moor on 12th April. Halmyre, 27th; Largo, 28th; Cramond, Thornliebank, and Beith, on 29th April. The writer saw one alive which was caught by a policeman on night duty, on 22nd November, near Glasgow.

Charadrius pluvialis (Golden Plover).—Small parties at the Flannans between 4th and 19th October.

Squatarola helvetica (Grey Plover).—At Dundrennan (Solway), a small flock on 14th April. One in Bute, 6th and 10th October ("A.S.N.H.," 1905, p. 54).

Vanellus vulgaris (Lapwing).—Appeared at Carmichael (Lanark), 5th February, and arrived on breeding grounds, Auchinblae (Kincardine), on 23rd February. On 12th March a flock at the Flannans, and on 13th large numbers at Corsewall. On 24th April, on Mearns Moor, near Glasgow, seventeen nests, one with *five* eggs (Robert Wilson).

Strepsilas interpres (Turnstone).—Left Sule Skerry, where they had passed the winter on 29th April. Forty were seen on 8th May in Bute. Seven at Sule Skerry on 1st June seemed on passage. On 28th July appeared at Skerryvore, Bell Rock, on 17th August, and Fairlie (Ayr) on 27th.

Hæmatopus ostralegus (Oyster-Catcher).—At Skerryvore on 10th March a large flock passed north. They came from the south, passing over the tower at full speed. Weather clear, but very dark. Wind S.W., light breeze.

Phalaropus fulicarius (Grey Phalarope).—One ♀ found dead at Lendalfoot (Ayr) on 9th October.

Scolopax rusticula (Woodcock).—Much larger numbers of woodcock than usual nested this year in central Scotland ("A.S.N.H.," 1904, p. 191), also in Dumfries (*l.c.* pp. 246-7).

Gallinago major (Great Snipe).—Four are reported—from Unst 20th September ("A.S.N.H.," 1905, p. 55); the Flannans, 3rd October (*l.c.* p. 82); Stirkoke (Caithness), 8th October; and one from Dumfriesshire on same date (both from "The Field," 1904, p. 654).

G. cœlestis (Common Snipe).—A great rush at the Flannans on 17th February, and a rush on 10th December at same place. At Tiree quite abundant, especially early in the season. At Sule Skerry on 29th August about a dozen "arrive for winter."

G. gallinula (Jack Snipe).—A remarkable visitation at the Flannans on the 17th September ("A.S.N.H.," 1905, p. 82).

Tringa subarquata (Curlew-Sandpiper).—A dead female was picked up at Lendalfoot (Ayr) on 30th September.

T. striata (Purple Sandpiper).—Several at Skerryvore, 4th August, and three at the Bell Rock on 15th September. One got at Loch Lomond in January is an addition to the fauna of the loch.

T. canutus (Knot).—Two at Fairlie (Ayr), 16th August, and a dozen in same locality on 3rd September.

MACHETES PUGNAX (Ruff).—One (♂ juv.) at Barrock, Caithness, 11th October.

TOTANUS HYPOLEUCUS (Common Sandpiper).—At Beith, 14th; Bothwell, Halmyre, and Ballo Reservoir (Fife), 16th; Glencorse, on the Pentlands, and Duddingston, 17th April, are the earliest reports; while the latest is at Cobbinshaw Reservoir, 21st September.

T. OCHROPUS (Green Sandpiper).—One at Polmadie (Glasgow) on 11th December ("A.S.N.H.," 1905, p. 120).

T. CALIDRIS (Redshank).—Arrived at Auchinblae (Kincardine) on 26th February, "snow on ground"; at Cloverhill (Tweed), 17th March; Kirkmuirhill (Lanark), 24th March. A white one is reported from Barra, 23rd October.

T. CANESCENS (Greenshank).—One at Fairlie (Ayr), 17th September, and one in Bute, 10th October ("A.S.N.H.," 1905, p. 54).

LIMOSA LAPPONICA (Bar-tailed Godwit).—A pair at Loch Arienas (Morven) on 11th June; four at Fairlie (Ayr), 3rd September.

NUMENIUS ARQUATA (Common Curlew).—At Corsewall numbers seen on 6th and 17th March. Returned to breeding grounds, 18th, Auchinblae (Kincardine). Small numbers in July and August seen on three days at the Flannans. Sule Skerry, 18th December, eight arrived for winter.

N. PHÆOPUS (Whimbrel).—At the Flannans on 5th May (1), 7th May (3), 22nd May (17); Bute on 19th and 23rd May; at Inch Fad (Loch Lomond), 30th July.

HYDROCHELIDON NIGRA (Black Tern).—One at Gladhouse Reservoir (Moorfoots), 7th September, and another at Gullane, 26th November ("A.S.N.H.," 1905, p. 119).

STERNA FLUVIATILIS (Common Tern).—The earliest and latest dates relating to this species are from Largo, viz. 14th April (3), and 27th September (a few). All other reports of arrival refer to the period 8th to 25th May.

LARUS MINUTUS (Little Gull).—One at Uyeasound, 3rd May ("A.S.N.H.," 1904, p. 157).

L. RIDIBUNDUS (Black-headed Gull).—Two new colonies are reported as being established between Arbroath and Montrose.

L. GLAUCUS (Glaucous Gull).—One at Sule Skerry, 20th January; one young (30th January), and two adults (1st and 5th February), near Stromness.

L. LEUCOPTERUS (Iceland Gull).—One (*juv.*), 17th May, Tobermory ("A.S.N.H.," 1904, p. 247).

Rissa tridactyla (Kittiwake).—First seen on cliffs at Noup Head on 27th February, and at the Flannans two days later. An immature one on 27th April at Cambuslang, Lanark, is only the second known occurrence for the county. Last seen at Noup Head, 3rd September; a large flock appeared at the Bell Rock on 24th November.

Pagophila eburnea (Ivory Gull).—One at Largo Bay, 14th September ("A.S.N.H.," 1905, p. 53).

Stercorarius pomatorhinus (Pomatorhine Skua).—One at Hunterston (Ayr), 17th February ("A.S.N.H.," 1904, p. 192).

S. crepidatus (Richardson's Skua).—One at Fairlie (Ayr), 13th August.

S. parasiticus (Buffon's Skua).—A pair shot near New Pitsligo, Aberdeen, 23rd May ("Zoologist," July 1904, p. 266).

Alca torda (Razorbill).—Arrived at the Flannans on 23rd March; Noup Head, 24th. All away from Noup Head by 8th August.

Uria troile (Guillemot).—Landed at the Flannans for the first time for season on 26th February. All away from Noup Head by 8th August.

Mergulus alle (Little Auk).—Near Stromness, 29th January, a pair; Dunbar, 27th November, one ("A.S.N.H.," 1905, p. 119); Arbroath, 16th November, one.

Fratercula arctica (Puffin).—At Sule Skerry, 16th; Noup Head and the Flannans, 17th April. All away from Noup Head on 10th August.

Colymbus glacialis (Great Northern Diver).—Bute, 8th May ("A.S.N.H.," 1905, p. 54); Loch Aline, Sound of Mull, 11th June, a pair.

Podicipes griseigena (Red-necked Grebe).—Largo, 23rd December, one.

Procellaria pelagica (Storm Petrel).—Breeding on the Bass Rock ("A.S.N.H.," 1905, p. 55).

Oceanodroma leucorrhoa (Leach's Fork-tailed Petrel).—Arrived at Sule Skerry about 10th June. Notes on nesting at the Flannans ("A.S.N.H.," 1905, p. 85).

Puffinus gravis (Great Shearwater).—One picked up dead on the shore at Lendalfoot (Ayr) on 3rd October. New to "Clyde."

Fulmarus glacialis (Fulmar).—All away from Noup Head on 8th August. Returned to cliffs on 25th November.

All who have sent schedules or other communications to enable this report to be prepared are most heartily thanked for their kind co-operation. It is particularly requested that, in future, correspondents should supply information relating to ornithology in all its aspects, in order that the annual report may be put on a broader basis than heretofore, and consequently be made more generally interesting.

1150 Cathcart Street, Glasgow.

ADDITIONS TO SCOTT AND LINDSAY'S LIST OF ANIMALS FOUND IN THE UPPER ELF LOCH.

By William Evans, F.R.S.E.

Messrs. Scott and Lindsay's excellent paper on the 'Upper Elf Loch,' Braid Hills,—published in the Transactions of the Edinburgh Naturalists' Field Club for 1897-98 (vol. iii. pp. 276-287, and 369-384),—having created an interest in the fauna of that pond, it is well that the list should be made as full as possible. With this view, I am induced to record the following 47 species taken by myself, and not given in the paper referred to. When necessary, specimens have been submitted to experts, whose kind assistance will be individually acknowledged in other papers upon which I am engaged.

Furcularia forficula (Ehr.).—This rotifer was detected by Mr. James Murray in material I sent him in June last.

Polycelis nigra (Ehr.).—A somewhat pale form of this common fresh-water Planarian is abundant in the pond, and is probably the "flat-worm" referred to by Scott and Lindsay.

Stylaria lacustris (L.).—Common, especially so in May and June 1905.

Lumbriculus variegatus (Müll.).—Taken in some numbers in October 1904, and again this spring. This and the *Stylaria* are the only Oligochæts I have found in the pond.

Glossiphonia stagnalis (L.).—A few examples of this small leech were obtained this spring.

Herpobdella octoculata (L.).—Also a couple of this species.

Asellus aquaticus (L.).—During April and May, 1905, this crustacean was so plentiful in the loch that at least half a dozen occurred in every haul of a small hand-net. This is especially interesting, seeing that Scott and Lindsay drew attention to its apparent absence in 1896-98.

Piona fuscata (Herm.).—The most abundant water-mite in the pond; males, though less numerous than females, were common this spring.

Hydryphantes ruber (De Geer.).—Another Hydrachnid, of which a single specimen was captured in May.

Notaspis lacustris, Mich.—An interesting Oribatid mite, of which I have recently secured about a dozen examples from this pond.

Diplocephalus permixtus (Cb.).—One male. Though, of course, not aquatic, this spider and the next are partial to marshes.

Gongylidium dentatum (Wid.).—Taken on two occasions, in March and May.

The additional Insects identified are:—

Collembola.

Sminthurus aquaticus, Bourl.—Abundant on water plants and on the surface of the water during summer and autumn. I expect this is the *Podura aquatica* of Scott and Lindsay's list. The true *Podura aquatica*, L., is rare in this district, and I have looked for it in vain on the upper Elf Loch.

Isotoma palustris (Müll.).—Is also very common on this pond.

Hemiptera.

Gerris aspera, Fieb.—A few examples captured in May and June last.

G. lacustris, L.—Have taken this also.

Corixa distincta, Fieb.—Common.

C. fallenii, Fieb.—One specimen identified.

C. mœsta, Fieb.—A few secured this spring.

C. semistriata, Fieb.—Not scarce.

C. prœusta, Fieb.—Plentiful during April and May last.

Neuroptera.

Enallagma cyathigerum, Charp.—I have seen this little dragon-fly at the pond, but not recently.

Rhithrogena semicolorata, Curt.—This May-fly is common this year.

Ecdyurus venosus, F.—♂s of this species also obtained.

Leuctra klapaleki, Kempny.—Several taken in October 1904.

Phryganea obsoleta, M'L.—Have taken several specimens.

Limnophilus vittatus, F.—Common on water plants in October last.

Sericostoma personatum, Sp.—A few in June, 1905.

Leptocerus aterrimus, Stph.—Two, June.

Polycentropus flavomaculatus, Pict.—One, July.

Coleoptera.

Hydroporus palustris, L.—Taken on several occasions; quite common in May last.

Agabus bipustulatus, L.—One, September 1895.

Ilybius ater, De Geer.—Three, May and June 1905. A rather uncommon beetle in this district.

Colymbetes fuscus, L.—Have taken single examples on two occasions.

Acilius sulcatus, L.—♀ captured in June.

Hydrobius fuscipes, L.—One, November 1896; common in May 1905.

Helophorus aquaticus, L.—Taken a number of years ago.

H. æneipennis, Thoms.—Common in May last.

H. brevipalpis, Bedel.—Two in May.

Stenus pubescens, Steph.—Taken on several occasions. Though not strictly a "water" beetle, this species is almost invariably found on water plants.

Donacia versicolorea, Brahm.—A single example was obtained on 13th October 1904, and others occurred this year.

Diptera.

Chironomus plumosus, L.—Taken this summer: the imago of one of the "blood-worms" so plentiful in the pond.

C. riparius, Mg., and *C. virescens*, Mg.—Common in end of June.

Orthocladius dolens, Wlk.—Numbers flying over the water in beginning of May last.

Tanypus varius, F.—Hatched from pupæ got in the pond; taken also on the wing in May.

Eristalis intricarius, L.—One flying over the pond on 11th June. The larvæ live in the liquid mud.

I may add that I remember when a pair of water-hens (*Gallinula chloropus*) frequented this tarn, and have seen their nest there. Messrs. Scott and Lindsay speak of the minnow being there. It must, surely, have been artificially introduced. It has never come under my notice, and I have known the pond for many years.

EDINBURGH, *July* 1905.

ON THE DIPTERA OF THE FLANNAN ISLANDS.

By PERCY H. GRIMSHAW, F.E.S.

THE following is a list of the Diptera collected by Mr. W. Eagle Clarke during his sixteen days' sojourn on the Flannan Islands in the month of September 1904. About 340 specimens were captured, and these represent something like 40 distinct species. It is, to say the least, surprising to find such a variety of Diptera on this small storm-swept and remote group of islands, and some of the species, such as the unidentified *Pericoma*, *Blepharoptera modesta*, *Limosina crassimana*, and a fine unknown *Spilogaster* with large and conspicuous spots on the abdomen, are of much interest. Our knowledge of the insect life of all the outlying islands round our coasts is extremely limited, and a collection such as that made by Mr. Eagle Clarke, and very kindly submitted to me for examination, must always be of great value to the student of distribution. All the specimens have been presented by Mr. Eagle Clarke to the Royal Scottish Museum.

1-2. *Sciara* spp.—Three females, representing two distinct species which I have not been able to identify. They both belong to Section II. of the Monograph by Winnertz.

3. *Scatopse notata*, L.—Two females.

4. *Chironomidæ*.—Thirty-four specimens. I have hitherto paid so little attention to this Family that I must reserve the publication of my records until the identifications are less doubtful than they are at present.

5. *Pericoma* sp.—One specimen.

6. *Tipula* ? *confusa*, V. d. Wlp.—Four males and two females of what I take to be this species.

7. *Tipula paludosa*, Mg.—Two females. A common and universally distributed species.

8. *Sympycnus annulipes*, Mg.—Two specimens. The only representative of the *Brachycera* obtained by Mr. Clarke.

9. *Syrphus corollæ*, F.—Two males.

10. *Syrphus luniger*, Mg.—Two females. Both species of *Syrphus* are of general occurrence.

11. *Cynomyia mortuorum*, L.—Seven males and three females. Evidently an abundant species on the islands.

12. *Musca domestica*, L.—The Common House-Fly. One male and four females.

13. *Calliphora erythrocephala*, Mg.—The Common Blow-Fly or Blue-Bottle. Fourteen males and ten females.

14. *Euphoria cornicina*, F.—Twelve males and eleven females. A very common and universally distributed species of "Green-Bottle."

15. *Spilogaster duplicata*, Mg.—Two females.

16. *Spilogaster* sp.—A female specimen belonging to this genus is probably the most interesting Fly in the collection. It is a large one, with conspicuous spots on the abdomen, and quite unlike anything known to me. It is unfortunate that only one example was obtained, as it may represent a very rare or even a new species.

17. *Hydrotæa irritans*, Fln.—A single female of this well-named Anthomyiid. Probably common on the islands.

18. *Anthomyia sulciventris*, Ztt.—Six males and eighteen females. The latter sex was previously unknown to me, but after a careful examination and comparison with the male I have no hesitation in assigning these eighteen well-preserved females to this species. They will be useful eventually for description.

19. *Phorbia florilega*, Ztt.—Nine males and twenty-one females, belonging, I believe, to this species. *Phorbia*, however, is a difficult genus, and requires much material and long and careful study before the species can be identified with certainty. I have not previously met with this species.

20. *Phorbia* sp.—A single female. Quite distinct from the preceding, but without the accompanying male I cannot identify it.

21. *Homalomyia canicularis*, L.—One female. Elsewhere an abundant species, especially in dwellings, and presumably so on the Flannan Islands.

22. *Scatophaga stercoraria*, L.—Twenty-six males and twenty-seven females. It would be difficult to say where this common brightly-coloured "dung-fly" does *not* occur!

23. *Scatophaga litorea*, Fln. — Twenty-five males and nineteen females. An abundant species round our coasts.

24. *Scatophaga squalida*, Mg.—A single male. This species is often found at the summits of high mountains.

25. *Cœlopa* (? or *Fucomyia*) spp. Twelve males and six females belonging to this curious genus. As I do not yet properly understand the species, I cannot here refer to the present specimens with any degree of preciseness.

26. *Blepharoptera modesta*, Mg.—Five specimens, identified by the use of Loew's Monograph, agree well with the description of this species. I had not previously seen examples, and its occurrence on the Flannan Islands is of much interest.

27. *Scatella sibilans*, Hal.—Five specimens. } Both common
28. *Scatella stagnalis*, Hal.—Five specimens. } species.

29. *Drosophila graminum*, Fln. — Twenty-three specimens. A common and widely distributed species.

30. *Agromyza* sp.—A single specimen, which I am unable to determine.

31. *Ceratomyza denticornis*, Panz.—One specimen.

32. *Chromatomyia affinis*, Mg.—One specimen.

33. *Borborus geniculatus*, Mcq.—Two specimens of this easily recognised species.

34. *Limosina crassimana*, Hal.—A single male of this very distinct species.

35. *Ornithomyia avicularia*, L.—One specimen.

Royal Scottish Museum, Edinburgh.

SPIDERS OF ST. KILDA.

By the Rev. O. Pickard-Cambridge, M.A., F.R.S., etc.

A small collection of arachnids lately received through the kindness of Mr. James Waterston of Edinburgh, by whom they were collected in the island of St. Kilda early in the present summer, is of some special interest, not altogether from what it contains, but perhaps more from what it does not contain. One would have thought that a spot so

isolated and so far north as the island of St. Kilda would, during several weeks' collecting, have furnished more specially northern forms, and probably some new to science, even out of the few met with; but out of twenty-five species of *Araneidea* there is not one which is not recorded at various points quite to the south coast of England, while of the four species of *Phalangidea* one only is a northern form, and so to a certain extent peculiar. In the subjoined list I have noted the points of interest that have occurred to me in respect to the species recorded. There does not appear, from the notes Mr. Waterston kindly sends me, on locality and habitats, any noteworthy variation in the known and recorded habits of the species met with. The fewness of the arachnidous forms met with by Mr. Waterston may be perhaps accounted for chiefly by the limited time he had to devote specially to this group.

ARACHNIDA.

ARANEIDEA

Clubiona holosericea, *De Geer.*—Adults of both sexes as well as immature examples. One would judge from the number of specimens that the species is an abundant one in St. Kilda, as it also is in most damp and swampy situations throughout England. The examples are also quite as large as those found in more southern localities.

Prosthesima Petiverii, *Scop.*—An adult, and an immature female. The species is abundant in the southern parts of England. Mr. Waterston remarks on the voracity of this spider.

Tegenaria Derhamii, *Scop.*—Adults of both sexes of this common and widely distributed house-spider.

Amaurobius fenestralis, *Stroem.*—Immature examples of this species, which is abundant in the north of England, but gets scarce southwards.

Phyllonethis lepida, *Walck.*—A single adult female of this very small species, which had lost all but one leg. The occurrences of this little spider are few and far between in Great Britain, the only records known to me hitherto are from Cumberland, Middlesex, and in marshy spots in Dorsetshire, where it is a fairly common species.

Robertus (*Pedanostethus*) lividus, *Bl.*—Both sexes adult of this widely dispersed and abundant spider.

Leptyphantes blackwallii, *Kulcz.*—An adult male and several females. These examples are rather remarkable, the male especially, for their dark rich colouring and markings compared with those met with in the south of England. It is an abundant spider and found in most British localities.

Leptyphantes pallidus, *Cambr.*—Two adult females of this somewhat local but widely spread species.

Bathyphantes variegatus, *Bl.*—Adult and immature females. In the north of England this very distinct little species is abundant, but it is comparatively rare in the south.

Bathyphantes concolor, *Wider.*—Adults of both sexes. It appears to be a common and universally dispersed British spider.

Centromerus (*Tmeticus*) concinnus, *Thor.*—A single example of the female. Further researches will perhaps result in the relegation of this species into a variety only of *C.* (*Tmeticus*) *bicolor*, Bl. Kulczynski considers it to be only a variety. At present the form "concinnus" seems to be tolerably constant, and recognisable without difficulty. I have given it here as a *Centromerus*, a genus formed by Dahl with *C. bicolor*, Bl., as its type, and including others of the heterogeneous group known hitherto under *Tmeticus*, Menge. This group, though I have myself up to now kept it in its entirety, undoubtedly needs careful subdivision.

Tmeticus Huthwaitii, *Cambr.*—Adult females. This would appear to be a rather common spider in St. Kilda (as it also is in some parts of England), but the male seems generally to escape capture somehow. The adult male would probably be met with early in spring, and later in autumn.

Tiso vagans, *Bl.*—A single adult male. Not a rare spider in Scotland and England, but perhaps rarer in the south than in the north.

Erigone promiscua, *Cambr.*—Adults of both sexes. The female has only recently been recorded (from St. Leonards-on-sea, Sussex); but the males have occurred throughout England and Scotland, and also in North Wales, though more numerously in the north than in the south.

Dicymbium nigrum, *Bl.*—A single adult male. A common and widely dispersed spider.

Savignia frontata, *Bl.*—An adult male and two females. An abundant spider in England, Wales, and Scotland.

Walckenaera nudipalpis, *Westr.*—Two adult females. Somewhat local and rare, but widely dispersed in Scotland and England.

Ero thoracica, *Wid.*—Females with their curious and pretty little pear-shaped egg-cocoons. Widely dispersed and not rare.

Meta merianæ, *Scop.*—Immature females, of this common and widely dispersed species.

Nesticus cellulanus, *Clerck.*—An immature female of this widely dispersed semi-domestic spider; found generally in cellars, damp caves, and among rocks in dark places.

Xysticus cristatus, *Clerck.*—Immature females. Common and universally distributed.

Xysticus kochii, *Thor.*—An immature male only. Although not adult I do not feel any doubt about this specimen. The species is rarer northwards, but tolerably abundant in the south of England.

Pirata piraticus, *Clerck.*—Adult and immature females. Apparently an abundant spider in St. Kilda, as it also is in many parts to the south of England.

Trochosa terricola, *Thor.*—Immature examples only of this common and widely dispersed spider.

Lycosa pullata, *Clerck.*—Male and females, adult. Common and universally distributed throughout Great Britain.

Phalangidea.

Oligolophus alpinus, *Herbst.*—Examples of what I believe to be this species were contained in the St. Kilda collection. It has also occurred in other parts of Scotland (Balmoral and Isle of Arran, as well as near Glasgow). Mr. Waterston speaks of it as "the most abundant arachnid seen."

Oligolophus morio, *Fabr.*—A single immature example, which I feel sure is of this species, was the only one contained in the collection.

Oligolophus palpinalis, *Herbst.*—An immature example only, but I feel very little doubt of its being of this species. Since the publication of my monograph,[1] I have received it from several localities (besides Dorsetshire), both in England and Scotland. It appears to be a rare though widely dispersed species.

Nemastoma lugubre, *O. F. Müller.*—Several examples. It seems to be almost universally distributed in England and Scotland.

Bloxworth Rectory, Wareham.

[1] "Monograph of Brit. Phalangidea," 1890, 'Proc. Dorset Field Club,' xi. p. 190.

ADDITIONS AND CORRECTIONS TO THE TOPOGRAPHICAL BOTANY OF SCOTLAND.

By James W. H. Trail, A.M., M.D., F.R.S.

(*Continued from p.* 177.)

Ranunculaceæ.

Clematis Vitalba, L., 75, 97, 98, 102.
Thalictrum alpinum, *L.*, 101, 107.
T. minus, *L.*, 105.
a. maritimum, *Syme*, 74, 84, 96, 102.
b. montanum, *Wallr.*, 87, 104, 108.
c. flexuosum (*Reichb.*), *delete* 109.
T. flavum, *L.*, 75 ?, 100.
Anemone nemorosa, *L.*, *except in 109, 110, 111, 112.*
Adonis autumnalis, L., Perthshire.
A. æstivalis, L., casual, 83.
Ranunculus fluitans, *Lam.*, 72.
R. trichophyllus, *Chaix*, 73, 74, 84, 90, 93.
R. Drouettii, *Godr.*, 72, 93, 96, 98, 99, 100. *Delete* 103.
R. heterophyllus, *Web.*, 74, 86, 109.
R. peltatus, *Schranck*, 76, 79, 86.
b. truncatus (*Hiern*), 72, 73, 74, Perthshire.
c. floribundus (*Bab.*), 72, 73, 74, 76, 86.
d. penicillatus (*Hiern*), 72, 73, 74, 77, 80, 86.
R. Baudotii, *Godr.*, 74, 88, 89, 93, 95, 99, 109.
c. marinus, *Fr.*, 110.
R. hederaceus, *L.*, 105.
R. Flammula, *L.*, the variety radicans, *Nolte*, is common and widespread.
R. reptans, *L.*, 88.
R. scoticus, *Marshall* (= *R. petiolaris*, Marshall), 86, 107.
R. Lingua, *L.*, 73 (?), 74, 96, 104 (?).
R. auricomus, *L.*, 74, 84, 106 (?).
R. acris, *L.* Of the forms of this variable species the following have been detected in Scotland :—
subsp. Boræanus (*Jord.*), 91, 92, 93, 96, 97, 105.
var. tomophyllus (*Jord.*), 91, 92, 93, 97, 108, 109, 112.
var. rectus, *Bor.*, 91, 92, 93, 94, 112.
subvar. pumilus, *Wahl.*, 94, 96, 112.
var. Nathorstii, *A. Berl.*, 88, 92 (?), 97, 98.
subsp. Steveni, *Andrz.*, 74, 88-90, 92, 93, 98, 108, 109, 111, 112.
subsp. Friesianus (*Jord.*), 112.
var. vulgatus, *Jord.*, 88, 92, 93, 112.

R. bulbosus, *L.*, *except 98, 103, 104, 105, 112.*
R. Sardous, *Crantz*, 73, 91.
R. arvensis, *L.*, 72, 86. *Delete* 75.
R. falcatus, L.; *R. muricatus*, L.; and *R. parviflorus*, L.; all casuals in 83.
Caltha palustris, *L.*, *var.* Guerangerii (*Bor.*), 72 (?), 110.
var. minor, *Syme*, 72, 86, 88, 91, 94, 96, 98, 100, 105. *Delete* 95.
C. radicans, *Forster*, 88, 92, 93, 96, 97, 108.
var. zetlandica, *Beeby*, 96.
Trollius europæus, *L.*, 102.
Helleborus viridis, L., 72, 82, 102.
H. fœtidus, L., 89 outcast.
Delphinium Ajacis, L.; *D. nudicaule*, Torr. and Gray; *D. orientale*, J. Gay; casuals in 83.
Nigella damascena, L., casual in 83.
Eranthis hyemalis, Salisb., 83, Perthshire.
Aquilegia vulgaris, *L.*, 74, 76, 98, 99.
Aconitum Napellus, L., 72, 73, 92.

Berberidaceæ.

Berberis vulgaris, *L.*, *except 93, 94, 98, 99, 103, 104, 107, 108.*
Epimedium alpinum, L., reported by Sonntag from 83, 85, 86, 87.

Nymphæaceæ.

Nymphæa lutea, *L.*, 72, 84.
N. pumila, *Hoffm.*, 92.
Castalia speciosa, *Salisb.*, *var.* minor, DC., 96, 97, 98, 100, 104, 108.

Papaveraceæ.

Papaver Rhœas, *L.*, 72, 73, 74, 101.
var. strigosum (*Boenn.*), Perthshire.
P. dubium, *L.*, 104.
var. Lecoquii (*Lamotte*), 72, 83.
P. Argemone, *L.*, 74, 76, 99, 103.
P. pavoninum, M. & F., casual in 92.
Meconopsis cambrica, Vig., 73, 74, 76, 77, 84, 96.
Glaucium flavum, *Crantz*, 100, 112.
G. corniculatum, Curt., casual in 83.
Rœmeria violacea, Medic., casual in 83.
Escholtzia californica, Cham., casual in 83.
Hypecoum grandiflorum, Benth., casual in 83.
Chelidonium majus, L., probably in most counties from Inverness and Lanark southwards, 100, 106.

FUMARIACEÆ.

Neckeria solida, 72.
N. lutea, Scop., 72, 83, 86, 89, 93.
Fumaria pallidiflora, *Jord.*, 72, 74, 86, 87, 89, 93, 94, 95, 108, 110, 111.
F. purpurascens, *Pugsley*, 111.
F. Boræi, *Jord.*, 72, 80, 81, 83, 84, 93, 94, 95, 97, 107.
F. confusa, *Jord.*, 73, 103, 104, 111. *Delete* 103.
F. Vaillantii, *Loisel*, 84.
F. parviflora, *Lam.* For 89 (?) read 90 (?).

Some of the records for *Fumaria*, in the capreolate group of species, are probably erroneous owing to incorrect determination of the forms. The species of *Fumaria* can scarcely be regarded as more than colonists in Scotland.

CRUCIFERÆ.

Cheiranthus Cheiri, L., 72, 73, 74, 80, 82, 83, 85, 86, 93.
Nasturtium officinale, *R. Br.*, *var.* siifolium (*Reichb.*), has been found in 89, and *var.* microphyllum (*Reichb.*) in 88, 89, 92.
N. sylvestre, *R. Br.*, 76, 80, 92 (?) (extinct), 98.
N. amphibium, *R. Br.*, 92 casual.
Barbarea arcuata, *Reichb.*, 89 casual, 109.
B. intermedia, *Bor.*, 72 (?), 73, 80, 83.
B. præcox, R. Br., 73, 83, 89 casual.
Arabis albida, Stev., escape, 83.
A. petræa, *Lam.*, 95, 96, *delete* 106 (?).
var. hispida, *DC.*, 94, 108.
var. ambigua, *DC.*, 88, 98.
A. ciliata, *R. Br.*, reported, but with doubt as to the species, from 90, 98, 103, 110.
A. hirsuta, *Scop.*, *except 78, 93, 96, 99, 111, 112.*
A. Turrita, L., reported, by Sonntag, from 84, 86.
Cardamine amara, *L.*, *except 78, 82, 84, 97, 101-104, 105* (??), *106* (?), *107-112.*
C. flexuosa, *With.*, 73, 82, 93, 107.
Draba muralis, L., 76, 80, 86, 98, usually a mere casual, established in Glen Farg, and as a field weed near Edinburgh.
D. incana, *L.*, 86.
D. rupestris, *R. Br.*, 105, 108, 111 (?).
Erophila vulgaris, *DC.*, 101, 107.
E. præcox, *DC.*, 109.
E. inflata, *Hook. f.*, 108.
Cochlearia alpina, *H. C. Wats.*, 86, 106 (?), 111, 112.
C. micacea, *E. S. Marshall*, 90, 97.
C. danica, *L.*, 101, 105, 109.

C. grœnlandica, *L.*, 91, 93, 97, 103, 107, 111.
C. anglica, *L.*, 72, 77 (?), 83 (?), 85 (?), 86 (?), 96, 99, 106, 110.
C. Armoracia, L., casual or escape only, 80, 83, 85, 92.
Hesperis matronalis, L., frequent, but little more than outcast or casual; reported from 72, 73, 74, 76, 83; Perthshire, 92, 93, 105.
Sisymbrium Thalianum, *J. Gay*, 101, 105, 107.
S. officinale, *Scop.*, *var.* leiocarpum, *DC.*, 84, 91, 95, 105.
S. Sophia, *L.*, 92 casual, 96, 107†, *delete* 84.
S. altissimum, L. (= *S. pannonicum*, Jacq.), frequent casual, 83, 86, 88, 92, 94.
S. fugax, Lag., *S. Iris*, L., *S. Loeselii*, L., all casuals in 83.
Erysimum cheiranthoides, L., 83, 86, 92, 96, 97.
E. repandum, L., casual in 83.
E. orientale, R. Br., casual in 86.
Camelina sativa, Crantz, 72, 75, 83, 85, 86.
var. *fœtida*, Fr., casual in 86.
Subularia aquatica, *L.*, 72, 75, 76.
Brassica monensis, *Huds.*, 88†, 90 (?), 100, 101, 104 (?); Sonntag reports it from "several places" by the Forth in 84 and 86, but confirmation is much required.
B. sinapioides, Roth., casual in 84, 86, 87, 92.
B. adpressa, Boiss., casual in 87.
B. Erucastrum, L.; *B. Tournefortii*, Gouan; *B. dissecta*, Boiss.; and *B. elongata*, Ehrh.; casuals in 83.
B. juncea, Goss, casual in 83, 92, 94.
B. alba, Boiss., 72, 75, 86, 93, 107, 108.
Diplotaxis tenuifolia, *DC.*, 72†, 83†, 85, 88†; D. muralis, *DC.*, 75, 83 casual, doubtful natives of Scotland.
Coronopus didymus, *Sm.*, 86†, 87†.
C. Ruellii, *All.*, 86, 109†, introduced by man into many, if not into all, of its habitats in Scotland.
C. pinnatifidus, Dulac, casual in 83.
Lepidium ruderale, L., casual or escape, 75, 91. Noted as "probably imported" even by Lightfoot.
L. virginicum, L., casual in 83, 92, 94.
L. campestre, *R. Br.*, 92 casual, 93 (probably †), 95†; *delete* 96†.
L. Draba, L., 83, 84, 86 (?).
L. incisum, Roth., and *L. perfoliatum*, L., casuals in 83.
Thlaspi arvense, *L.*, 99; a colonist only.
Isatis tinctoria, L., casual in 83 and 85.
Neslea paniculata, Desv., casual in 83, 86, 90, 92.
Crambe maritima, *L.*, 92 (specimen gathered on beach at Aberdeen in 1837, ? casual), 110.
Cakile maritima, *L.*, 104, 105, 107.
Raphanus Landra, Mor., casual in 83.
R. sativus, L., casual in 83 and 92.

The following species, belonging to genera not already noticed in the original list or above, have been found growing as escapes, or more often on waste ground near towns, especially near docks and railway stations, and on rubbish heaps. For convenience of reference they are arranged alphabetically :—

Alyssum calycinum, L., 82, 83, 85 ; *A. campestre*, Bieb., 83, 94 ; *A. incanum*, L., 83, 88, 89, 93 ; *A. maritimum*, L., 85, 92.
Bareava orientalis, Jaub. and Spach., 83.
Bunias orientalis, L., 83, 85, 92, 93.
Calepina Corvini, Desv., 83.
Conringia orientalis, Dum., 83.
Enarthocarpus lyratus, DC., 83.
Eruca sativa, Mill., 83, 92.
Erucaria aleppica, Gaertn., 83.
Euclidium syriacum, R.Br., 83.
Lunaria annua, L., 82, 83, 92 ; *L. rediviva*, L., 88.
Malcolmia africana, R.Br., 83, 94 ; *M. maritima*, R.Br., 83, 92-94.
Matthiola bicornis, DC., 83 ; *M. incana*, R.Br., 83 ; *M. tristis*, R.Br., 92.
Myagrum perfoliatum, L., 83.
Rapistrum glabrum, Host, 83 ; *R. orientale*, DC., 83, 90 ; *R. perenne*, All., 83 ; *R. rugosum*, All., 83, 92, 94.

Resedaceæ.

Reseda lutea, *L.*, was regarded as "apparently native" in Fife by Dr. Boswell Syme, and in East Perth by Dr. White ; but elsewhere in Scotland it is usually little more than a casual, and has no claim to be considered even apparently native. It has been recorded from 75, 77, 81-87, 89, 90, 92, 95, 96, 106, usually on rubbish.
R. Luteola, *L.*, 74, 93 casual.
R. alba, L., casual, 92 ; *R. odorata*, L., 83.

Cistaceæ.

Helianthemum Chamæcistus, *Mill.* Lismore being included in Argyll, not in West Ness, the record should be for 98, *not* for 97.

Violaceæ.

Viola odorata, *L.*, 74, probably not native in Scotland.
V. silvestris, *Reichb.*, 84, 88, 109, 112.
V. ericetorum, *Schrader*, 72, 93, 95, 97, 105, 107, 110.

V. tricolor, *L.*—Of the numerous forms of this species distinguished in France by Jordan two have been recorded from Scotland, viz. *var.* Sagoti, from 90 and 92 ; and *var.* lepida, from 89 and 96. Both belong to the so-called *subspecies* saxatilis (*Schmidt*). No doubt other forms will also be discovered here.

V. arvensis, *Murr.*, from every district, usually as a weed of cultivation.

V. curtisii, *Forster*, 74, 91, 93, 104, 105, 107.

var. Pesneaui, *Rouy* and *Foucaud*, 74, 91, 92, 93.

V. lutea, *Huds.*, 95, 105, 107.

var. amœna (*Syme*), 74 ; Perthshire, 95, 96, 97, 104, 106, 109, 111. The *subvar.* insignis, *Ed. Baker*, with larger flowers, is represented by specimens gathered in 1794 by Robert Brown on Ben Lawers, now in British Museum herb.

Viola cornuta, L., appears likely to establish itself by streams and roads, 72, 83, 87, 92, 93, 94.

Polygalaceæ.

Polygala vulgaris, *L.*, aggregate, *except 79.*

P. vulgaris, *segr.*, 75, 91, 93, 94, 98, 104.

P. oxyptera, *Reichb.*, 75, 76, 92, 93, 94, 95, 96, 98, 108, 111.

var. collina, *Reichb.*, 106.

P. serpyllacea, *Weihe*, 75, 76, 80, 82.

Caryophyllaceæ.

Dianthus barbatus, L., occasionally by streams and on rubbish, outcast or escape, *e.g.* in 82, 92.

D. cæsius, Sm., escape or casual, 83.

D. deltoides, *L.* I found this, in September 1904, with flowers almost white but not otherwise different from type, near Bervie in 91.

Saponaria Vaccaria, L., rather a common casual, 83, 93.

S. officinalis, L., rather frequent, 84 and 85 (Sonntag), 87.

Silene Cucubalus, *Wibel*, *except 97, 98, 103, 108, 110, 112* ; not native in 109 and 111.

S. maritima, *With.*, *except 78, 79, 80, 86.*

S. conica, *L.*, 91, casual ; native in 95, *teste* G. C. Druce.

S. dichotoma, Ehrh., not uncommon in grass fields, also on rubbish, 83, 91, 96.

S. anglica, *L.*, 94 casual, by Spey.

var. *quinquevulnera* (L.), casual on rubbish, *e.g.* in 92.

S. gallica, L., casual, 83.

S. læta, A.Br., casual on rubbish, 92.

S. acaulis, *L.*, 106.

[*S. italica*, Pers., a specimen in Kew Herbarium from Kincardineshire (Gardiner), has been referred to this, but there seems uncertainty about the name.]

S. noctiflora, *L.*, 75, 76†, 81†, 83†, 87†, 90, 92†, doubtful if native in Scotland.

S. Armeria, L., casual, 83; *S. conoidea*, L., casual, 83; *S. Muscipula*, L., casual, 83.

Lychnis alba, *Mill.*, 80, 84, 100, 107, 111.

L. Viscaria, *L.*, *delete* 86, the record resting on a locality (Dunmyat) in 87.

L. Githago, Scop., not native in Scotland, but a weed of cultivation in all *except 78, 79, 97, 98, 104, 107, 108.*

The following *Sileneæ* have also been found as casuals in Scotland:—*Gypsophila muralis*, L., 83; *G. paniculata*, L., 83; *G. porrigens*, Boiss., 83.

Cerastium tetrandrum, *Curtis*, 72, 93, 103, 104.

C. semidecandrum, *L.*, 108, 109; 97 needs confirmation.

C. glomeratum, *Thuill.*, *var.* apetalum, *Dum.*, 88, 93, 98, 105, 106, probably not uncommon.

C. triviale, *Link.*, *var.* alpinum, *Mert. and Koch.*, 72 (?), 88, 98, 105, 108, 110. *Delete* 90, 112.

var. fontanum, *Link.*, has been recorded from 97.

C. alpinum, *L.*, *var.* pubescens, *Syme*, 96, 97.

C. arcticum, *Lange*, 87 (?), 90, 92, 96, 99.

C. arvense, *L.*, 83.

C. trigynum, *Vill.*, 106 (?).

C. dichotomum, L., casual, 83.

Stellaria aquatica, Scop., 77 (?), 80†, 86†, 90 (?) [111 error?].

S. nemorum, *Cyr.*, 74, 85.

S. media, *Cyr*, *var.* Boræana (*Jord.*), 96, 106, 107.

var. major, *Koch.*, 72, 95, 96, 105, 108, 110.

S. umbrosa, *Opiz.*, 109.

S. palustris, *Ehrh.*, 74.

S. uliginosa, *Murr.*, 84.

Arenaria verna, *L.*, 94.

A. sulcata, *Schlecht*, 107.

A. tenuifolia, *L.*, in "Top. Bot." ed. 2, recorded for 83 and 85 with grave doubt. Sonntag gives it for 84, 85, 86, but his evidence lacks weight.

A. serpyllifolia, *L.*, 104.

var. leptoclados (*Guss.*), 72, Perthshire, 92, 94, 96.

var. Lloydii (*Jord.*), 110.

A. peploides, *L.*, 83, 89; *var.* diffusa, 105, 109.

A. sedoides, *Schultz*, 106, 107.

Sagina maritima, *Don*, 97, 107.

var. alpina (*Syme*), 94, 96.

var. debilis (*Jord.*), 108.

S. apetala, *L.*, 75, 76, 84, 91, 95, 100, 101.

S. ciliata, *Fr.*, 93, 95, 96.

S. procumbens, *L.*, *var.* spinosa, *S. Gibs.*, 72, 107.
S. Linnæi, *Presl.*, 94.
S. subulata, *Presl.*, 105, 106; Dumfries (72) needs confirmation.
S. nodosa, *Fenzl.*, 107.
Spergula vulgaris, *Boenn.*, 93, far less frequent weed than *sativa.*
S. sativa, *Boenn.*, probably in all districts, *except* perhaps *112*, though not recorded from some. Too abundant generally.
Buda rubra, *Dum.*, 107, 109.
B. marina, *Dum.*, 84, 97, 105, 107, 110.
var. genuina, 95, 105, 107, 108, 110, 111.
var. media, *Fr.*, 74, 106.
var. neglecta (*Kindb.*), 75, 93, 94, 96, 100, 103, 106, 107.
B. media, *Dum.*, 92, 96, 109.
B. rupestris, 105; 93 requires confirmation.
Polycarpon tetraphyllum (L.), casual 80, 86.

Portulaceæ.

Claytonia perfoliata, Don, 83, Perthshire, 92, 96.
C. sibirica, L., 73, near Glasgow, 83, Perthshire, 91, 93.
Montia fontana, *L.*, 84.

Elatinaceæ.

Elatine hexandra, *DC.*, 112.

Hypericaceæ.

Hypericum Androsæmum, *L.*, *delete* (?) after 106.
H. perforatum, *L.*, add 102. 112 requires further evidence. The varieties angustifolium, *Gaud.*, and lineolatum (*Jord.*) have been recorded from 72.
H. dubium, *Leers.*, 84, 101, 103. *Var.* maculatum, *Bab.*, has been recorded from 72, 73, 88.
H. quadratum, *Stokes*, 84.
H. humifusum, *L. except 78, 84, 96, 105, 107, 108, 110, 111, 112.*
H. pulchrum, *L.*, *var.* procumbens, *Rostrup*, 105.
H. hirsutum, *L.*, 74, 84.
H. montanum, *L.*, *delete* 98.
H. elodes, *L.*, 101, 104. Sonntag gives it for 83 and 86, but his records require confirmation.

Malvaceæ.

Althæa hirsuta, L.
Hibiscus Trionum, L. } Casuals in 83.
Lavatera arborea, *L.*, casual in 94.
Malva moschata, *L.*, 91†, 93†, 105†, 108†.

M. sylvestris, *L.*, 105†, 107†.
M. rotundifolia, *L.*, 73 *cas.*, 88† (instead of 89†), 107.
M. ægyptia, L., *M. nicæensis*, All., and *M. verticillata*, L., all casuals in 83.
M. parviflora, L., casual, in 83 and 92.

Linaceæ.

Radiola linoides, *Roth.*, 110. Sonntag records it for 82 and 83.
Linum usitatissimum, L., has been noted in 72-75, 77, 82, 83, 85, 94, 105; but it is nowhere native, and as a relic of cultivation or a casual it may probably be met with in almost every county.
Citrus Aurantium, L., comes up abundantly as a seedling on rubbish near towns occasionally, *e.g.*, in 83 and 92; but of course does not survive winter. I have also met with other species of *Citrus* once or twice.

Geraniaceæ.

Geranium sanguineum, *L.* Dixon has recorded this for 105 (Gairloch); but it requires confirmation.
G. phæum, L., escape, planted, or outcast, in 72-75, 83, 84 and 85 (Sonntag), 87-92.
G. sylvaticum, *L.*, 74.
G. pratense, *L.*, 84, 111†.
G. pyrenaicum, *Burm. f.*, 83†, 91†.
G. pusillum, *L.*, 103 (not 102). This has been recorded from the counties around Aberdeen; but I have never been able to find it there, nor have I seen an example found in these counties; hence I believe the record to be erroneous.
G. columbinum, *L.*, 72. *Delete* 81. 82 ("Dunbar," Sonntag) requires confirmation.
Erodium ciconium, Willd. and *E. malachoides*, Willd., both casuals in 83.
E. moschatum, L'Herit., casual in 82, 83.
Oxalis corniculata, L., garden weed in 93.
Impatiens Noli-tangere, L., 73† (not 74†).
Tropæolum majus, L., 83, etc., and *T. minus*, L., 93, casuals on rubbish.

Celastraceæ.

Euonymus europæus, *L.*, 75, 77†, 95†. Probably introduced in all but a few localities in Scotland. *E. latifolius*, L., has been introduced into woods, *e.g.* in 83.

SAPINDACEÆ.

Acer campestre, *L.*, 86†, 87†. *Delete* 102.

Æsculus Hippocastanum, L. The Horse Chestnut, though so frequent in Scotland, rarely seems to be self-sown, and the trees seem almost always to have been planted where they grow.

LEGUMINOSÆ.

Lupinus nootkatensis, Sims. This is the lupine so abundant along the Tay, the Dee, and the Beauly, formerly supposed to be *L. perennis*, but correctly identified in 1900 ("Ann. Scot. Nat. Hist.," 1900, pp. 127, 128).

Genista tinctoria, *L.* Sonntag records this from 78 and 84, and A. Davidson from 105, but all require confirmation.

G. anglica, *L.*, 78 (Sonntag).

Ulex Gallii, *Planch.*, 75, 90, 100†. Sonntag recorded this for 78, 86, 87, but his records require confirmation.

Cytisus scoparius, *Link*, 110†.

C. Laburnum, L. A very frequent plant by roads and by edges of plantations, some being self-sown. *C. alpinum*, though less frequent, is not uncommon in similar places.

Ononis spinosa, *L.*, has been recorded by Sonntag for 87 (Dollar), but needs confirmation.

O. alopecuroides, L., casual in 83.

Trigonella cærulea, Ser., a rather frequent casual, 83, 94, 95.

T. polycerata, Led., casual, in 83, 92.

T. aurantiaca, Boiss, *T. corniculata*, L., *T. Fœnum-græcum*, L., *T. hamosa*, L., and *T. monspeliaca*, L.; all casuals in 83.

Medicago sativa, L., casual, or almost a denizen, in 83, 85 (Sonntag), 86, 94, 95.

M. falcata, L., casual or semi-naturalised, 83, 86.

M. denticulata, Willd., casual usually, 75, 76, 83, 86.

M. arabica, Huds., casual usually, 99.

M. apiculata, Willd., *M. Echinus*, DC., *M. elegans*, Willd., *M. minima*, Desv., *M. orbicularis*, Willd., *M. pentacycla*, DC., *M. platycarpa*, Trautv., *M. scutellata*, Mill., *M. truncatula*, Willd., *M. tuberculata*, Willd. These ten have been found as casuals in 83.

M. marginata, Willd., casual in 92.

M. tornata, Willd., casual in 85.

Melilotus officinalis, Lam., usually little more than a casual, but almost a denizen in some places, 74, 94, 106, 109.

M. alba, Desr., rarely more than a casual, 76, 95, 99. *Delete* 84 and 97.

M. arvensis, Wallr., casual, 76, 83, 85, 86.

M. indica, All., casual, 72, 83, 86.

M. elegans, Salzm., and *M. messanensis*, All., casuals in 92.
M. sulcata, Desf., casual in 83.
Trifolium incarnatum, L., casual, 82 and 84 (Sonntag), 83, 91, 93.
T. arvense, *L.*, 101, 111† (?).
T. striatum, *L.*, 72, 101, 111†.
T. scabrum, *L.*, 91 (confirmed).
T. glomeratum, L., casual, 92.
T. fragiferum, *L.*, casual in 92.
T. subterraneum, L., casual in 75.
T. agrarium, L., in grass-fields, frequent, 86.
T. clypeatum, L. *T. formosum*, D'Urv., *T. fucatum*, Lindl., *T. lappaceum*, L., *T. maritimum*, Huds., *T. mutabile*, Portensch., *T. resupinatum*, L., *T. spumosum*, L., *T. supinum*, Savi., *T. tomentosum*, L. All these ten have been found as casuals in 83.
Anthyllis Vulneraria, *L.*, *var.* coccinea, *L.*, 88 (?), 108.
var. maritima, *Schweigg.*, 103, 110.
Lotus tenuis, *Waldst.* and *Kit.*, *delete* (?) after 80.
L. uliginosus, *Schkuhr*, 95, 97. The *var.* hirsutus is less common than the glabrous plant.
L. edulis, L., casual in 83.
Astragalus danicus, *Retz.*, 77, 106.
A. bæticus, L., and *A. hamosus*, L., casuals in 83.
Hymenocarpus circinatus, Savi., casual in 83.
Oxytropis uralensis, *DC.*, 87 (?), *Delete* 75.
Ornithopus perpusillus, *L.*, 106 (?).
O. compressus, L., casual in 83.
Securigera Coronilla, DC., casual in 83.
Coronilla varia, L., casual in 84 and 93
C. scorpioides, Koch., casual in 83 and 94.
Hippocrepis comosa, *L.*, 91† (?).
Onobrychis Crista-galli, L., casual in 83.
Scorpiurus subvillosus, L., casual in 92.
S. sulcatus, L., casual in 83.
Pisum arvense, L., and *P. sativum*, L.; frequent casuals, *e.g.* in 83, 91, 92, 94, 95.
Phaseolus vulgaris, L., occasional casual, *e.g.* in 83.
Lens esculenta, Moench., casual in 83.
Vicia gemella, *Crantz*, 86 *cas.*, 93 *cas.*, 96†, 106 (?).
V. gracilis, Loisel, casual in 73, 83.
V. sylvatica, *L.*, 98.
V. lutea, *L.*, 94 *cas.*, recorded by Sonntag for 84 and 86, but require confirmation.
V. angustifolia, *L.*, 104.
V. lathyroides, *L.*, 107.

The following species of Vicia have occurred as below on rubbish, among tares, etc., as casuals :—

V. bithynica, L., 83, 85; *V. calcarata*, Desf., 83; *V. dasycarpa*, Ten., 83, 93; *V. Ervilia*, Willd., 83; *V. hybrida*, L., 83; *V. melanops*, Sibth., 83, 93; *V. monanthos*, Desf., 83; *V. narbonensis*, L., 83; *V. pannonica*, Crantz, 83, 93; *V. peregrina*, L., 83; *V. Pseudocracca*, Bertol., 83; *V. tenuifolia*, Roth., 83; *V. villosa*, L., 83.

Faba vulgaris, Moench. A frequent casual on rubbish or from cultivation.

Lathyrus Aphaca, L. Casual or semi-naturalised here and there, 76, 93.

L. sylvestris, *L.*, 88 extinct.

The following species have been found as below, but are only casuals:—*L. amœnus*, Frenzl., 83; *L. angulatus*, L., 83; *L. blepharicarpus*, Boiss., 83; *L. Clymenum*, L., 83; *L. grandiflorus*, Sibth. and Sm., 83; *L. hirsutus*, L., 83; *L. inconspicuus*, L., 92, 94, 95; *L. Ochrus*, L., 83, 92; *L. odoratus*, L., 83, 92; *L. sativus*, L., 83; *L. sphæricus*, Retz, 83.

Ceratonia Siliqua, L., seedlings have been found about Leith Docks in 83.

ROSACEÆ.

Prunus insititia, *Huds.*, 102, 104, 105† (?), 106†.

P. domestica, L. This has been recorded for 72, 73, 75, 83, 85-89, 105, and probably occurs in all of these and in other counties, but only where originally introduced.

P. avium, *L.*, 84, 93, 101, 105, 106; this is so generally scattered by birds that it is practically impossible to determine where it has been directly introduced by man.

P. Cerasus, L., *delete* 88†.

P. Padus, *L.*, 93.

Spiræa salicifolia, L., almost naturalised in many places, but usually where originally introduced, 96, 105†.

Spiræa Ulmaria, *L.*, var. denudata *Boenn.* This is widespread (92, 93, 94, 95, 105), but is not constant, the leaves varying on the same plant from the ordinary type to well-marked *denudata*.

S. Filipendula, *L.*, 95.

ADDITIONAL RECORDS TO "TOPOGRAPHICAL BOTANY," 2nd Ed., 1883.

By ARTHUR BENNETT, F.L.S.

IN the Journal of Botany, as a Supplement, the whole of the records since 1883, and many before, of which I had not any previous knowledge, are now appearing to the end of 1903.

The present record carries on those of Scotland for 1904, and in addition some omitted before, others only since communicated, etc.

The numbers and sequence of the counties are the same as in "Top. Botany," the names not always so.

72. Dumfries.

Ranunculus penicillatus, "Flora Dumfries."
Papaver Rhœas, *M'Andrew, in litt. ex* Trail.

73. Kirkcudbright.

Ranunculus penicillatus, "Fl. Dumf."
Carex rigida, "1800 ft.," *C. Waterfall, sp.*

74. Wigton.

Ranunculus trichophyllus, *Druce, in litt. ex* Trail.
,, heterophyllus } "Trans. Dumf., etc., Soc.," No. 10,
,, peltatus } p. 74.
,, auricomus, *M'Andrew, sp. ex* Trail.
Aquilegia vulgaris } *M'Andrew, in litt, ex* Trail.
Berberis vulgaris }

76. Renfrew.

Ranunculus floribundus, *Somerville, in litt. ex* Trail.
Draba muralis, "J. Bot.," 1902, p. 54.

77. Lanark.

Galium sylvestre, *M'Nab*, Herb. Mus. Brit.

84. Linlithgow.

Ranunculus bulbosus, *Somerville, sp., ex* Trail.
Nuphar lutea } *Somerville, in litt. ex* Trail.
Fumaria pallidiflora }

86. Stirling.

Nuphar intermedium, *Stirling* and *Kidston.*
Saussurea alpina, *J. Dalton*, 1809, York. herb.
Mentha alopecuroides, *Kidston*!.

88 Mid Perth.

Hieracium diaphanum, Fr., *Druce.*
Rhinanthus stenophyllus } *Druce*, "A.S.N.H.," 1904, p. 119.
Thymus Chamædrys }
Juncus tenuis, *W. Barclay, sp.*

89 East Perth.

Juncus tenuis, *Miss Armitage, sp.*
Rhinanthus stenophyllus, *Druce*, "A.S.N.H.," 1904, p. 115.

90. Forfar.

Cochlearia micacea, *E. S. Marshall, sp.*
Betula intermedia, *Marshall.*

91. Kincardine.

Ranunculus sardous, Cochlearia grœnlandica, Rhinanthus major — *Trail.*

92. Aberdeen, South.

Ranunculus sardous, casual; Galium erectum — *Trail.*

93. Aberdeen, North.

Ranunculus sardous, casual, "J. Bot, 1884," p. 238.

94. Banff.

Polygala oxyptera, Rubus fissus, Hieracium Sommerfeltii, Euphrasia brevipila — *Moyle Rogers*, in "J. Bot.," 1903, p. 16.
Rumex conglomeratus, Carex aquatilis — *Moyle Rogers, l.c.*

95. Elgin.

Fumaria pallidiflora, *Trail.*
Polygala oxyptera, Alchemilla vulgaris, β alpestris, Pohl., Rubus fissus, „ corylifolius, Epilobium tetragonum, seg. — *Moyle Rogers, l.c.*
Orchis incarnata, *Moyle Rogers, l.c.*

96. Easterness.

Rumex sanguineus, Euphrasia stricta — *Moyle Rogers*, "J. Bot.," 1904, p. 16.

97. Westerness.

Ranunculus scoticus, *Macvicar, sp.*
Caltha "radicans"
Erysimum cheiranthoides †
Viola canina
Rubus pyramidalis
Drosera obovata
Armeria maritima, *var.* pubescens
} *Druce*, in "A.S.N.H.," 1904, p. 38.

Rhinanthus Crista-galli, *var.* monticola
var. borealis
Euphrasia stricta
Mentha piperita †
M. rubra †
Thymus Chamædrys
Lamium amplexicaule
Poa pratensis, *var.* subcœrulea, *Sm.*
} *Druce, l.c.*

98. Argyll.

Ranunculus auricomus, *J. M'Rae* !.
Cochlearia micacea, "J. Bot.," 1894, p. 289.
Viola Curtisii, *Druce*, "Sc. Nat.," 1889, p. 106.
Vicia sylvatica
Viburnum Opulus
} *J. M'Rae* !.

99. Dumbarton.

Nuphar intermedium, *Watt.*
Cochlearia anglica, *Somerville.*

102. Ebudes, S.

Ranunculus trichophyllus, *Druce, in litt. ex* Trail.
Saxifraga tridactylites, *Dr. Gilmour, sp.*

105. Ross, W

Barbarea vulgaris, *Druce*
Cochlearia grœnlandica
} "Trans. Ed. Bot. Soc.," 1894, p. 131.
Luzula arcuata, "at 3830 ft.," *A. H. Evans.*
Carex riparia.

107. Sutherland, E.

Ranunculus scoticus, *Druce, in litt. ex* Trail.

108. Sutherland, W.

Thalictrum montanum, *Marshall.*
Barbarea vulgaris, "J. Bot.," 1886, p. 344.
Viola canina, "Sc. Nat.," 1889, p. 110.
Rhinanthus major, *C. E. Salmon.*

109. Caithness.

Barbarea vulgaris, "J. Bot.," 1885, p. 338.
Scabiosa arvensis, *A. Sutherland, sp.*
Carex riparia, *D. Doull, sp.*

111. Orkney.

Fumaria purpurascens, *Pugsley*, "J. Bot.," 1904, p. 186.

112. Shetland.

Rhinanthus major, *Beeby*, "Scot. Nat.," 1890, p. 29.

PLANTS OF ROXBURGH, HADDINGTON, AND BERWICK.

By G. Claridge Druce, M.A., F.L.S.

I spent a day or two by the Tweed at Melrose and in the neighbourhood of Hawick, where I noticed the following plants. Those marked * appear to be new county records.

Ranunculus peltatus, *Fries.*—In the Tweed, and as a mud form on the temporarily exposed shore. No personal authority in "Top. Bot."

R. Lingua, *L.*—In a marsh near Minto.

Cochlearia Armoracia, *L.*—By the Tweed at Melrose.

Nasturtium palustre, *Br.* (Radicula Nasturtium).—Melrose. No personal authority in "Top. Bot."

*N. sylvestre, *Br.* (R. sylvestris).—By the Tweed at Melrose.

*Polygala serpyllacea, *Weihe.*—Melrose.

*Lychnis alba, *Mill.*—Near Melrose, a weed of cultivation.

*Spergula sativa, *Boenn.*—Melrose.

Acer Pseudo-platanus, *L.*—By the Tweed, probably planted.

*Rubus Selmeri, *Lindeb.*—Melrose.

*R. dasyphyllus, *Rogers.*—Melrose.

*Rosa glauca, *Vill.*, R. rubiginosa, *L.*, R. coriifolia, *Fries.*, *R. dumetorum, *Thuill.*—All by the Tweed, Melrose, with R. lutetiana, *Lam.*

Alchemilla vulgaris, *L.*, var. *alpestris* (Schmidt).—By the Tweed at Melrose, and also var. *filicaulis* (Buser).

Valeriana sambucifolia, *Mikan.*—By the Tweed at Melrose, and a small form near Hawick.

Galium boreale, *L.*—Tweedside, no personal authority.

*Sonchus asper, *Hill.*—Near Melrose.

*Arctium minus, *Bernh.*—Melrose.

*A. intermedium, *Lange.*—Near Melrose.

*Carduus crispus, *L.*—Melrose Abbey.

*Matricaria inodora, *L.*—Tweedside.

Senecio viscosus, *L.*—By the Tweed at Melrose. *Volvulus sepium, *Junger.*—Near Melrose, doubtfully native. *Thymus Chamaedrys, *Fries.*—Near Melrose.

Atriplex patula, *L.*—Melrose.

Rumex domesticus, *Hartm.*—Melrose, by the Tweed.

*Ulmus montana, *Stokes.*—By the Tweed at Melrose.

*Quercus sessiliflora, *Salisb.* (Q. fœmina, *Miller*).—Melrose, etc. N.C.R.

Salix purpurea, *L.*—By the Tweed.

Orchis maculata, *L.*, var. **ericetorum* (Linton). Melrose.

*Agrostis alba, *L.*—Melrose.

*Festuca rubra, *L.*—Melrose.

*Arrhenatherum bulbosum, *Presl.*—Melrose.

Poa nemoralis, *L.*, var. *coarctata*, Gaud.

Papaver somniferum, *L.*, occurred as an alien by the Tweed, where Ribes Grossularia and R. rubrum also were seen.

P. Rhœas, *L.*, var. *Pryorii*, Druce, in which the stem is clothed with dark crimson hairs, occurred near Melrose. Echium vulgare, *L.*, Cheiranthus Cheiri, *L.*, and Prunus avium, *L.*, grew on the Abbey walls. Lamium album, *L.* was seen in several places. Potentilla palustris, *Scop.*, and var. **villosa*, grew in a marsh near Minto.

In Haddingtonshire I noticed *Quercus sessiliflora, *Salisb.*, and Lychnis alba, *Mill.*

In Berwickshire, in the neighbourhood of Duns, I noticed the following plants, which are mostly without personal authority in "Top. Bot." A few marked with an asterisk are apparently new records. Lychnis alba, *Mill.*, and the hybrid *L. dioica, *L* × L. alba, *Mill.*; Polygala serpyllacea, *Weihe.*; *Cardamine flexuosa, *With.*; *Spergula sativa, *Boenn.*; Trifolium hybridum, *L.*; Potentilla palustris, *Scop.*, var. **villosa*; *Rosa glauca, *Vill.*; Potentilla silvestris (*P. erecta*, L.), forma; *R. coriifolia, *Fries.*; *Rubus Selmeri, *Lindeb.*; R. Rogersii, Alchemilla vulgaris, *L.*, var. *alpestris*, and var. *filicaulis*; *Epilobium

obscurum, *Schreb.*; Sedum villosum, *L.*, very luxuriant; Ribes Grossularia, *L.*; Ægopodium Podagraria, *L.*; Montia fontana, *L.*, **var.* major; Myrrhis Odorata, *Scop.*: Galium uliginosum, *L.*; Valeriana sambucifolia, *Mikan*; Crepis paludosa, *Moench.*; Arctium minus, *Bernh.*; Carduus heterophyllus, *L.*; *Lamium intermedium, *Fries*; L. album, *L.*; Clinopodium vulgare (*Calamintha vulgaris*, *L.*); *Galeopsis bifida, *Boenn*; *Thymus Chamædrys, *Fries*; *Mimulus Langsdorfii, *Don*; Veronica Anagallis, *L.*, with slightly glandular pedicels and graceful habit; V. scutellata, *L.*; Myosotis palustris, *Relh.*; M. repens, *Don*; Salix pentandra, *L.*; S. repens, *L.*; *Betula verrucosa, *Ehrh.*; Orchis maculata, *L.*, *var.* ericetorum (*Linton*); Carex disticha, *Huds.*; C. flava, *L.*; *Arrhenatherum bulbosum, *Presl.*; Glyceria plicata, *Fries*; Briza media, *L.*; Festuca rubra, *L.*; Agropyron caninum, *Beauv.*; Agrostis alba, *L.*, *var.* *gigantea, *Meyer*.

ZOOLOGICAL NOTES.

The Mole (*Talpa europæa*) **in Bute.**—In a recent paper on the 'Land Mammals of the Clyde Faunal Area' ("Trans. Nat. Hist. Soc. Glasgow," N.S. vol. vii.) Mr. Boyd Watt quotes Pennant's statement (1777) that the Mole occurs "among the isles only in Bute—a praise to its soil," and remarks, "I do not know that it occurs there now or in any of the other Clyde islands." It may therefore be worth recording that, on 11th January 1895, I caught a mole between Barone Hill and Loch Dhu in Bute, as incidentally mentioned in a paper on birds I observed in the island—"Annals" for 1895, p. 43.—William Evans, Edinburgh.

Notes on the Orkney Vole.—During May last I spent a few days at Stromness catching Orkney Voles (*M. orcadensis*, Millais), and thanks to hints from Mr. Eagle Clarke had no difficulty in discovering their haunts. They seem to be very fond of the roots of the Heath Rush (*Juncus squarrosus*) and make holes under the tufts of rushes to get at them. Although I dug out several burrows, I only succeeded in finding two nests, which were composed of a mass of dried grass and small roots. Both were placed in an enlarged part of the hole, not at the end, and only about a foot from the entrance. In neither of these nests were there any young, but perhaps it was rather early, as none of the females obtained were nursing, though several were pregnant with from two to six fœtus. The moults in *M. orcadensis* are rather interesting, and appear to be carried out in two ways. The spring moult takes place about the end of May, and many of the specimens which I caught were in the act of casting their coat. In some specimens the old hair is cast in

the ordinary way, as the new comes in, but in others the "pale yellowish brown" tips of the hair on the back and flanks are first cast, leaving the "slaty grey" under portion, and at the same time the long black hairs on the back drop out. When this has been completed over nearly the whole of the back the new hair may be seen coming in below the old, which drops out as the new increases in length. Occasionally all the tips are not moulted at the same time, and patches of old hair, with tips still adhering, are left here and there amongst the shortened tipless grey fur, giving the animal a very shaggy and unkempt appearance. The hair on the head and cheeks is moulted in the ordinary way, and so probably is that on the belly, but in none of my specimens is there any indication of a moult taking place on that part of the body. That some kind of moult on the belly does take place is certain, as the winter fur is considerably longer than that of summer. The Autumn moult takes place in August and September, and specimens collected by Mr. Robert Godfrey in August 1905, and Mr. Eagle Clarke in September 1904, show that it is carried out in the same two ways alluded to. Some young specimens obtained by Mr. Eagle Clarke at the same time and not half grown were just casting their first coat, which is duller and more of a House Mouse colour than that of adults and without the rufous on the belly. The change to adult pelage seems to take place first on the belly, and in two specimens the coat on the upper side of the body has not been changed at all, while that on the belly is quite as rufous as in any adult.—None of my specimens show any signs of melanism, and perhaps it was a Vole in a half-moulted state, as described above, which Mr. Millais saw near Loch Stennis and not a real melanic example.—Norman B. Kinnear, Edinburgh.

Common Field Vole in Islay.—With this I send for identification a small mammal which I take to be the Common Field Vole. It was found on 30th July in a sea cave in the Mull of Oe by a party of tourists led by Ronald M'Arthur, and was new to all of them. They thought it had been killed by being trodden on by one of their party, as the mouth was bleeding. I do not find any information as regards Islay in Harvie-Brown's "Fauna of Argyll and Inner Hebrides," though he has a paragraph (p. 40) relating to *Arvicola agrestis* in Jura.—T. F. Gilmour, Port Ellen, Islay.

[Dr. Gilmour is correct in his surmise. The animal sent is a typical specimen of *Microtus agrestis*, the Common Field Vole. We believe that it has not hitherto been recorded for Islay.—Eds.]

A White Porpoise (?) in Clyde Waters.—It may be of interest to naturalists to know that on the morning of June 12th, while crossing in the Caledonian Railway steamer from Kirn to Gourock, and about a quarter of a mile from Kirn pier, we passed a pure white cetacean which was lazily swimming up the frith in the

direction of the Holy Loch. It was first observed by a friend who accompanied me, and we had a splendid view of the animal as it rose and dipped again in the sea, its pure white skin glistening brightly in the morning sun. It seemed to be about 9 or 10 feet long, and may have been a porpoise or a dolphin; in any case it had the dorsal fin characteristic of these animals. On the Monday previous we saw a similar creature opposite Crarae in Loch Fyne, while sailing up the loch in the *Lord of the Isles*. It was some distance off, but from the hurried and imperfect look we had of it I took it to be a White-beaked Dolphin, which is not an unfrequent species off the Kintyre coast. It may, however, be the same animal as the one seen off Kirn. I am informed that a white porpoise was seen in Loch Long last summer, 1904, and may be the same animal.—J. Macnaught Campbell, Glasgow.

Bird Notes from Dumfriesshire, etc.

The Ring Ousel (*Turdus torquatus*).—Does not appear to be nearly so common a nesting species as in former years. Five years ago we could find several nests every spring; now, it is very difficult to find one.

Tree Creeper (*Certhia familiaris*).—A pair of these birds built their nest in a half-boarded-up window in an outhouse, which was in daily use. Such sites have been recorded before, but near the outhouse there were plenty of trees with convenient semi-detached bark, under which one would have expected this little bird to nest, rather than in so restless a spot.

Raven (*Corvus corax*).—A pair of these birds hatched their young at their annual nesting place. Luckily poisoned meat failed to kill the old birds; but the young ones were stoned to death by the shepherds, as last year the pair of old birds did tremendous damage to the lambs. The shepherds in this case must not be altogether blamed, their losses from this cause having been very great.

Pied Flycatcher (*Muscicapa atricapilla*).—I am glad to be able to report finding a nest containing five eggs in a hollow birch tree, close to a river, on 1st June this year. This bird has been known to visit us for a long time, but this is the first nest I have seen.

Curlew (*Numenius arquata*).—I found an abnormally large egg of this bird with two other normal varieties in one nest. The egg measured 3.1 × 2.25 inches.

Quail (*Coturnix communis*).—I am told that this bird still nests in fair numbers in Forfarshire, but have had no means of verifying this statement by personal investigation.

Tawny Owl (*Syrnium aluco*).—Nest in mouth of old rabbit's burrow. —Hugh S. Gladstone, Thornhill.

Black Redstart and other Birds at the Flannan Islands.—An adult female Black Redstart (*Ruticilla titys*) was obtained on Eilean

Mor on the 27th of June and forwarded to me in the flesh—a second instance of the erratic occurrence of birds at this island, the first being an autumnal visit from the Short-toed Lark. There is no accounting for the vagaries of birds during the time of their passage movements, nor can we explain why a Central and Southern European bird like the Black Redstart should be found in one of the remotest isles of Northern Britain during the breeding season.

A Spotted Flycatcher (*Muscicapa grisola*) was killed on the morning of June 14th, and sent for identification. This species has not been detected before as a migratory visitor to the islands.

A Sedge Warbler (*Acrocephalus phragmitis*) was obtained on the night of June 16th, and was also sent. This is another addition to the feathered visitors known to occur on this remote islet.

A fine brown and white variety of the Shag (*Phalacrocorax graculus*) with white feet was obtained on the 27th of July, and has been added to the collection of mounted birds in the Royal Scottish Museum.

I have to thank Mr. William Begg and Mr. Robert Anderson for the excellent notes on migratory birds occurring at this singularly interesting station for observations.—Wm. Eagle Clarke.

Piebald Water-ouzel in Argyll.—A pied Water-ouzel was observed by one of my family in September last near the mouth of a small stream on Loch Feochan. The entire head, neck, and breast were pure white. I do not remember any record of albino or pied varieties of the Dipper, so the occurrence appears to be worth noting.—Chas. H. Alston, Letterawe, Loch Awe.

[**Wryneck Nesting in Renfrewshire.**—In June 1904 a nest was found in a plantation near Darnley Rifle Range. The nest was situated in a hole in a decayed fir tree. The seven white eggs were laid on the crumbled wood, there being no nest material. The finders did not know what the eggs were and brought them to me for identification. After careful examination I pronounced them to be the eggs of the Wryneck (*Iynx torquilla*). For confirmation I sent the eggs to Mr. Harvie-Brown, who wrote me as follows: "Thanks for the sight of the Wryneck's eggs, which I most certainly consider to be quite correctly identified." It is interesting to know that this rare visitor has nested in Renfrewshire.—T. Thornton Mackeith, Caldwell, Renfrewshire.]

[The Wryneck occurs annually in Scotland, mainly on the East Coast, during the spring and autumn, when on its way to and from its summer haunts in N.W. Europe. It has been said to breed in Scotland before, but on evidence which cannot be regarded as satisfactory, and this to some extent applies to the present record.—Eds.]

The Wryneck in Shetland.—On the evening of 2nd September last a Wryneck in an exhausted condition was captured near Sumburgh House, Shetland. It was put in a large conservatory for the

night, but was found dead in the morning. On examination bruises were found from which it appeared the bird had met with some accident. It was a young male bird, and in fairly good condition. The Wryneck, on migration, was reported from Shetland on 1st September last year.—THOMAS BERWICK CLARKE.

Greenland Falcons in Scotland and Ireland.—I am duly interested in the account of Greenland Falcons in Ireland by Mr. Williams ("Irish Nat." October 1905, p. 201).

Undoubtedly the principal line of their migration flight is down along—*i.e.* N. to S.—from *Butt of Lewis* to Ireland. *But* they seem to strike the Outer Hebridean coast more frequently about the centre of the group, and pass southwards, and turn up at Barra and Mingulay more frequently (so far as our records show) than north of the Sound of Harris.

On the other hand, Snowy Owls appear more frequently in Shetland and Orkney and in the *extreme north* of Lewis or the Outer Hebrides than they do south of the Sound of Harris.

I possess two magnificent specimens of the Greenland Falcon—one presented to me years ago by Mrs. MacGillivray of Barra (Outer Hebrides), and one of a later date presented to me in the flesh by Mr. Finlayson, obtained in Mingulay (Outer Hebrides). These have been beautifully cased by Mr. Kirke, our talented taxidermist, of Glasgow. They have been duly recorded by me already.

Whereas the visitations of the Greenland Falcon appear to be only *at intervals of years* to the west coast of Ireland (*op. cit.* p. 202), I *believe* they are much *oftener* visitants to the Outer Hebrides.

Possibly in "course of time" their visits may become more frequent and regular to Ireland.

Nevertheless, I do not say that we can give records of *as many individuals* as have occurred in Ireland (*loc. cit.* p. 203, and quoting Mr. Ussher, "Birds of Ireland"). Their occurrences in Ireland, however, seem to possess more of the character of a *rush* (like Pallas Sand Grouse) than of any approach to a steady or regular influx.—J. A. HARVIE-BROWN.

Dotterel in Forth Area.—On the evening of 24th April a Dotterel (*Eudromias morinellus*) in immature plumage struck a wire at Pinkie, and was picked up by Master Jack Lyall, who presented the specimen to the Royal Scottish Museum. On 13th May another male Dotterel was found dead beside a barbed wire fence near Denny, Stirlingshire. This species has not been recorded for Stirlingshire since the days of the old statistical account.—J. A. HARVIE-BROWN and W. EAGLE CLARKE.

Woodcock Nesting in Shetland.—In May last Mr. Tomlinson of Musselburgh and I saw a Woodcock (*Scolopax rustica*) near Collafirth, which was evidently brooding, but we failed to find either the nest or young. On the 3rd of August I went to Uyea with my

brother and his son, and found two half-grown Woodcocks on the ground and flushed them, but they only flew a few yards, and I flushed one of them again. This is the first known record, I believe, of the Woodcock found nesting in Shetland.—R. C. HALDANE, Ollaberry, Shetland.

[It is right to remember that Saxby records seeing the eggs of Woodcock on Hermaness, N. Unst, on 23rd May (year?), and this is quoted in Buckley and Evans' "Fauna of Shetland," p. 163.—J. A. H.-B.]

Snipe migrating in a Flock at Tiree.—On the 20th October 1904, I noticed at about 2 P.M. a flock of birds coming from the north straight towards me. I thought at first that they were Golden Plover, but upon their coming nearer I saw that they were flying straight, but in a zig-zagging fashion, tacking up against the wind. They passed over my head, low down, and about thirty yards off. They were Snipe (*Gallinago cœlestis*), and there would be about one hundred of them. I thought they were going to alight on the island, but they held on in the direction of Dhuheartach.—PETER ANDERSON, Tiree.

[Mr. M'Elfrish recorded ("Annals" 1902, p. 121) a similar flight in Benbecula. Though not often observed, yet it is probable that when on migration Snipe of both species move in flocks. I have seen migrating flights of the Common Snipe in Faroe, and of Jack Snipe at the Flannan Isles.—W. E. C.]

New Breeding Station of the Fulmar Petrel in Shetland.—While staying at Scousburgh last May, I was interested in seeing several Fulmar Petrels (*Fulmarus glacialis*) flying about the cliffs a little to the north of Fitful Head. Mr. Thomas Henderson, jun., informs me that the first time he knew of or observed them was in 1900, and then only a pair or two. Since then they have increased every year, and now he thinks there are about thirty pairs nesting. The breeding colony is on two high peaks jutting out into the sea about quarter of a mile apart. In the "Vertebrate Fauna of Shetland," Messrs Evans and Buckley mention six different breeding colonies of the Fulmar Petrel, the farthest south being at the Noup of Ness, near Lerwick, which was discovered by Mr. R. Godfrey ("Ann. Scot. Nat. Hist." 1899, p. 53). On the west side the nearest breeding station to Fitful is at Foula, the oldest established colony in Shetland.—NORMAN B. KINNEAR, Edinburgh.

The Opah in Shetland.—A fine specimen of the Opah (*Lampris luna*) was washed ashore at Sumburgh, Shetland, on 6th September. The fish was in good condition, but it appeared on examination to have met with some accident, there being an extensive bruise with large quantity of coagulated blood in the flesh on the right side. It had possibly been struck by a steamer or other vessel. The fish when brought to Sumburgh House had not been long dead—the

fins and tail, etc., having retained their bright vermilion colour, which gradually faded in two or three days. It weighed 123 lbs., and was about 3 feet 9 inches from head to tail, and about 3 feet from back to belly, being nearly circular in shape. It is some years since a specimen of this fine fish has been seen in the South of Shetland.—THOMAS BERWICK CLARKE.

Planorbis fontanus (*Lightf.*) **in S.W. Perthshire.**—On 1st July 1905, I found a few living examples of this water snail at the foot of Loch Ard in South Perthshire (V.C. 87): they were on the undersides of leaves of the white water-lily. The few recorded Scottish localities for this species are, with two exceptions (Elgin and E. Ross), south of the Forth and Clyde.—WILLIAM EVANS, Edinburgh.

Chelifer latraillii, *Leach*, **in Fife.**—In the "Annals" for 1901, p. 23, I drew attention to a record of the occurrence of this chernetid in fissures in the rocks near North Berwick, where it was taken in September 1882 by Mr. H. Crowther. I can now record it from Elie, Fife, having found two examples—one carrying eggs—in cracks in the soft rocks near the harbour there, on 6th July this year.—WILLIAM EVANS, Edinburgh.

On the Occurrence of two Platypezids in S. Scotland.—On the 23rd July 1904, I took a male of *Opetia nigra*, Mg., in a marshy spot near "the Well," St. Boswells. There are few records for this fly in Britain. Of Scottish localities Mr. Verrall mentions specifically Muchalls, near Aberdeen. Mr. Grimshaw has recorded it from the Almond valley in his Perthshire list. On the 19th August this year I captured a male of *Callimyia amœna*, Mg., in some short undergrowth in a wood near Glencorse. The records hitherto are chiefly from South England, but it has also been taken at Rannoch (Verrall). Both species were captured by sweeping.—JAMES WATERSTON, Edinburgh.

Catabomba selenitica, *Mg.*, **in the Forth district.**—On 2nd August, in a fir-wood to the south of Midcalder, I found a male of this species newly emerged from the pupa. It has been identified by Mr. James Waterston.—ROBERT GODFREY, Edinburgh.

[We believe that this is only the second Scottish record for this handsome Syrphid fly. Since receiving the above note, however, we have seen an example of each sex taken by Mr. Grimshaw at Rannoch during the first week of August.—EDS.]

BOTANICAL NOTES AND NEWS.

Ranunculus reptans, *L.*, **in Mid Perth.**—This plant, which has hitherto been supposed to be confined in Scotland to the shores of Loch Leven in Kinross, and of the Loch of Strathbeg in Aberdeen-

shire, I had the pleasure of finding in small quantity in Mid Perth in July last. It grew on the sandy shore of Loch Tummel. The tiny flowers, wiry stems, arching from node to node, were quite characteristic. *R. Flammula* also being present.—G. Claridge Druce.

Caltha radicans, *Forst.*, in Mid Perth.—When making a fruitless search for *Scheuchzeria* at Methven in July I found this rooting *Caltha* growing in a marshy spot near the Loch of Methven. Subsequently I found it near the head of Loch Tummel, and there growing in the most typical condition I have yet met with, the radical leaves being of the shape figured in "Eng. Botany." The dry season was especially favourable for examining the marshes. In average seasons the plant might have been easily overlooked. I saw it also in Glen Dole, Forfar. At Llanberis, in Carnarvonshire, where I discovered it some years ago, I saw it this year in the original locality. Some plants had extended to a brook-side, the level of the water being considerably below the bank, and it was a little curious to see the plant bending over the stream, putting out rootlets at its nodes above the water which it was unable to reach. —G. Claridge Druce.

Rudbeckia laciniata, *L.*, in Perth.—This plant is recorded from the banks of the Tay in the "Flora of Perthshire." It is now so completely naturalised as to demand a place in our British lists. Some hundred of clumps may be seen on the western banks of the Tay, making a brave show. With it are associated almost acres of *Mimulus Langsdorfii*, two species of *Aster* not in flower, large quantities of *Allium carinatum*, L., and a few tufts of *Astrantia major*, in addition to rich riparian vegetation.—G. Claridge Druce.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1905.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

Late Nest of Yellow Bunting. T. Thornton Mackeith. *Zoologist*, September 1905, p. 347.—Nest containing one egg found in Renfrewshire on 27th August.

On the Nesting of the Rock-Dove (?) in a Rabbit's Hole at Nevay Park, Forfarshire. W. C. M'Intosh. *Zoologist*, July 1905, p. 268.—A pair of young found in a rabbit's hole in April 1905, and another pair seen on 24th June near

another hole. Reply by J. A. Harvie-Brown. *Zoologist*, August 1905, p. 313.

The Great Crested Grebe (Podicipes cristatus) in Scotland. T. Thornton Mackeith. *Zoologist*, August 1905, p. 314.—Three pairs seen on the Lake of Menteith (Perthshire), two nests being found, containing two and three eggs respectively.

Notes of Coleoptera captured during a Tour through Sutherlandshire, and at Aviemore, Inverness-shire, in the month of June, 1905. C. T. Cruttwell. *Ent. Mo. Mag.*, September 1905, pp. 209-210.—Fifty-five species recorded.

Diptera in Scotland. A. E. J. Carter. *Ent. Mo. Mag.*, July 1905, pp. 163-164.—Records of numerous species collected at Aberfoyle, Musselburgh, and Aberlady.

List of British Dolichopodidæ, with Tables and Notes (*continued*). G. H. Verrall, F.E.S. *Ent. Mo. Mag.*, July 1905, pp. 167-172, and August 1905, pp. 188-196.—Numerous Scottish localities are given in this important paper.

Notes on Tachinidæ, No. 1. Colbran J. Wainwright, F.E.S. *Ent. Mo. Mag.*, September 1905, pp. 199-207.—Numerous Scottish records included.

BOOK NOTICES.

Wasps Social and Solitary. By George W. and Elizabeth G. Peckham. London: Archibald Constable and Co., Ltd., 1905.

In this well-printed and nicely illustrated volume we find an admirably written account of several North American species of Hymenoptera, and as these possess very close relatives in Britain and the west of Europe, the particulars of their life-history and habits possess much interest. The book is fascinating in style, like the well-known insect-studies of M. Fabre, and the performances of these remarkable creatures are narrated in so honest a manner that the reader is convinced of the truth of statements which are, to say the least, most astonishing. We are told, for example, of a solitary wasp which filled up her nest by putting her head down into it and biting away the loose earth from the sides, jamming it down with her head, bringing more and more earth from the outside and finally picking up a small pebble in her mandibles and using it as a hammer, pounding the dirt down until the surface was "as hard and firm as the surrounding surface." But the whole book is full of intensely interesting details, and as the low price (six shillings net) is within the reach of all, it ought certainly to have a large and ready sale in this country. The only suggestion we have to make is that the word "American" might with advantage be inserted in the title in order to prepare the reader for the fact that most of the observations were made in Wisconsin.

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